L 803
.S3 A5
1911
Copy 1

St. Louis Public Schools

EDUCATIONAL MUSEUM

CATALOGUE
OF
Collections for Circulation

1911

CATALOGUE

EDUCATIONAL MUSEUM,

St. Louis Public Schools.

EDITION 1911.

To Principals and Teachers:—

This edition of the catalogue is to take the place of the edition of 1906, the supplements of 1907 and 1908, the lantern slide catalogue and its supplement of 1908.

To prevent confusion, all former editions of these catalogues should be returned to the Museum.

The catalogue of the Teachers' Library and The School Messenger of Feb. 9, 1909, should be kept for future use.

Respectfully,

BEN BLEWETT,

Superintendent of Instruction

L 503
.S2N5
1917

OCT 16 1917

EDUCATIONAL MUSEUM
OF THE
PUBLIC SCHOOLS OF ST. LOUIS.

THE SCOPE OF THE MUSEUM.

The Board of Education maintains an Educational Museum in order to improve the instruction in geography and science by furnishing apparatus, and illustrations for the daily lessons. In serving this purpose the museum is of practical advantage to every child and to every teacher.

It would not be feasible without excessive expense to supply every one of the hundred public schools of the city with a full set of physical apparatus, with large numbers of scientific specimens or with full geographical collections to illustrate the life of peoples and the products of the distant lands. It has not been impossible however, to gather such collections and store them in a central museum from which selections are sent to all the schools.

MATERIALS OF THE MUSEUM.

The material in the museum is grouped and arranged in accordance with the course of study. The groups are the following:

FOOD PRODUCTS: Comprising the cereals in the plant and grain and their products. Coffee, tea, sugar, cocao, the cocoanut, the various spices, etc.

MATERIALS FOR CLOTHING: The various animal and vegetable fibers of the world and the fabrics made of them.

OTHER NATURAL PRODUCTS: Foreign and domestic woods, rubber, gutta percha, camphor, cork, coal, etc., their various stages of development and their use; materials for dying and tanning; medicinal plants, etc.

INDUSTRIAL PRODUCTS: Showing the various processes in the manufacture of industrial products, as paper, ink, pen and pencil, glass, leather, etc.

ANIMALS: Mammals, birds, fishes, reptiles, insects, etc., mounted or in alcohol.

PLANTS: Models and colored representations.

MINERALS, ROCKS AND ORES.

EXHIBITS: Illustrating Life and History of other Nations.

APPARATUS FOR THE ILLUSTRATION OF PHYSICAL GEOGRAPHY.

APPARATUS FOR THE ILLUSTRATION OF ELEMENTARY PHYSICS.

CHARTS AND PHOTOGRAPHS FOR THE ILLUSTRATION OF HISTORY.

CHARTS ILLUSTRATING ASTRONOMY.

CHARTS ILLUSTRATING PHYSIOLOGY.

CLASSIFIED COLLECTIONS OF STEREOSCOPIC VIEWS AND LANTERN SLIDES for the illustration of Geography, History, Science, and Reading.

EDUCATIONAL EXHIBITS illustrating school work and school life in other countries.

In connection with the Museum there is a PEDAGOGICAL REFERENCE LIBRARY containing, beside REFERENCE books on all material sent out by the Museum, the best works on Educational Psychology, Child Study, School Management, etc., and the leading current Educational Periodicals for the use of teachers.

LOAN COLLECTIONS.

The material to be used in illustrating the lessons in geography, history, nature study, reading and art, has been divided into typical collections which will be sent to the schools upon requisition of the principal. A list of such collections, accompanied by a brief description of each article and a list of reference books giving more detailed information, will be found below.

ILLUSTRATIONS.

There are enumerated below collections which consist of objects, and others consisting of the pictorial illustrations connected with such collections. The two kinds should be used together. The pictorial illustrations are colored charts, photographs, wood cuts, stereoscopic views with stereoscopes, and maps.

Each teacher is invited to read this catalogue, and to determine which collections she wishes to use in her room.

GEOGRAPHICAL ILLUSTRATIONS.

Geography is the study in which important facts of life are presented to the children. They learn how every human industry, and, in fact, the whole life of man is dependent on climate, soil, and location. Necessarily much of the information presented must appear to the child as hearsay reports of things he has never seen. It must be the aim of instruction to make geography as much of a reality to the child, as much of a matter-of-fact study as may be done through pictures, and objects of illustration. The museum furnishes the means for effecting this purpose to every teacher.

The museum is especially well supplied with illustrations of agricultural and commercial products of the various parts of our country and of the world. The study of geography will become more thorough when the pupils can actually see the things which are the subjects of their lesson. Thus, when they study about the Cotton States, the museum furnishes illustrations of the cotton plant in its various stages of growth, of the harvesting, and the manufacture of the cloth. Stereopticon views give a vivid idea of the cotton fields, the way in which they are cultivated by the laborers, and the preparation and shipping of the cotton bales. The museum furnishes to every teacher who will avail herself of the opportunity, the means of making the work in geography more interesting to the children, and of making it the means of richer and more permanent information.

A large number of stereographs and photographs have been added to the material for the illustration of Geography. These illustrate life, industry, types of people, scenery, etc., in almost all countries of the world.

Another large group of stereographs illustrates Physical Geography. The collections have been arranged in accordance with the plan followed in our textbook. Every subject in the part of our "Advanced Geography" which treats of Physiography, may be illustrated by stereoscopic views

For the illustration of typical features of Physical and Industrial Geography, the museum furnishes sets of 15 stereographs each representing the same picture. This arrangement enables the teacher to give one picture to each 2 pupils and to discuss with the class intelligently what the picture represents.

TELLURIANS.

It is difficult to make young children understand the causes of the changes of the seasons and the succession of day and night. The museum has a number of Tellurians, an apparatus by which these changes can be illustrated and made more intelligible to the children. Principals should send requisitions for this apparatus when classes take up the study of this subject.

PHYSICAL APPARATUS.

The attention of principals and teachers is directed to the fact that apparatus for the instruction of classes in the elements of physics is obtainable from the museum. This will prove an aid to every teacher and will make the lessons in this important subject more instructive and profitable to the children.

BIRDS.

Collections of birds common in the United States are contained in the museum and will be sent to any school that applies for their loan. The children read about these birds in their reading lessons, and know their names, but they should become able to recognize them when they see them in the parks and fields.

REFERENCE BOOKS.

In connection with each group of articles the names of a number of Reference books are given which are on the shelves of the Teachers' Library, and will be delivered to the schools on requisition just as Museum collections are delivered.

With some of the collections a copy of some number of the "Museum," a periodical devoted to nature study, will be sent. The copy contains suitable information about the specimens sent.

PROMPT SERVICE.

The museum will soon have a sufficient number of duplicate collections of such material as is constantly in demand, to fill all orders sent by the schools promptly.

MUSEUM MATERIAL WHICH CAN NOT BE SENT TO THE SCHOOLS.

A large number of the objects in the museum are delicate and fragile and will not permit frequent transportation. Other articles are too heavy and bulky to be sent. Such material will remain on exhibit in the museum. Principals and teachers are invited to visit the museum often and to examine and study these exhibits.

The present catalogue contains the collections ready for use in the schools. It is not a complete catalogue of all the objects in the museum.

WEEKLY DELIVERIES.

Museum material will be delivered to each school once a week when an order has been sent to the custodian. The following table shows on what days schools will receive the material ordered:

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Central High	McKinley High	Adams	Yeatman High	Teachers' College
Soldan High	Board Office	Canterbury	Ames	Alabama Ave.
Arlington	Carr	Clifton	Blair	Blow
Ashland	Charless	Devonshire	Bryan Hill	Carondelet
Baden	Chouteau	Duncan	Carr Lane	Des Peres
Bates	Clinton.	Fanning	Clay	Eads Ave.
Benton	Clinton Branch	Gardenville	Columbia	Fremont
Burd Avenue	Douglas	Gratiot	Crow	Froebel
Clark	Franklin	Longfellow	Divoll	Gallaudet
Cote Brilliante	Patrick Henry	Mann	Eliot	Garfield
Dozier	Humboldt	Oak Hill	Howard	Grant
Emerson	Jackson	Rock Spring	Irving	Gravois
Farragut	Jefferson	Roe	Lincoln	Hodgen
Field	Laclede	Shaw	Lowell	Industrial
Harney Heights	Lafayette	Sherman	Penrose	Lyon
Harrison	Madison	Wheatley	Pope	Meramec
Hempstead	O'Fallon		Special No. 3.	Monroe
Kings Highway	Peabody		Special No. 6.	Mt. Pleasant
Kraft Street	Pestalozzi		Stoddard	Neosho Street
Marquette	Sigel		Banneker	Shepard
Marshall	Special No. 1.		Garnett	Special No. 5.
Riddick	Special No. 4.		L'Ouverture	Special No. 7.
Special No. 2.	Webster			Special No. 8.
Walnut Park	Dessalines			Wyman
Washington	Dumas			Delaney
Sumner High				
Simmons				

DIRECTIONS AS TO ORDERING AND RETURNING MUSEUM MATERIAL.

To facilitate the delivery of museum collections, principals and teachers are requested to observe the following suggestions:

Please see that your **Order** reaches the Custodian **48 hours** before time for delivery as much confusion is caused by orders coming in after the next day's deliveries have been packed and assigned a place on the wagons.

Whenever possible **order by mail** rather than by telephone. The Supply Department furnishes stamped envelopes for that purpose.

Order blanks for museum collections may be had upon application to the museum. In ordering collections kindly insert in the blank the number with which the collection you desire is marked in the lists below. In sending orders to the museum, principals may use the stamped envelopes sent to the schools, addressing them "Custodian Educational Museum, Wyman School, Eads and Theresa Avenues."

When ordering books from the library give Name of Author, Title of Book and **Catalogue Class Number** of book wanted.

When **renewing** books state **Date** when book is due, and the **Individual Number,** (**not** the Class Number) of that book.

PERIOD OF TIME DURING WHICH COLLECTIONS MAY BE KEPT.

All material ordered from the museum will be sent by the museum wagons and may be kept in the schools **one week.** On the regular delivery day of each week the driver will take back articles used during the preceding week, if there be any. Principals should see that all the material to be returned is **ready** when the driver comes.

Check up material, when received, as to **number** of boxes, packages, charts and books, O. K. these items on Driver's slip—**Do not** keep driver waiting while you check up the contents of each individual box, but notify Custodian by telephone **on day material was delivered** if contents of boxes are not complete.

In repacking lantern slides, minerals, shells, butterflies, insects, grains, etc., please be especially careful to replace each article in the **proper** box, and replace lantern slides in order of Catalogue.

The wagon will call for books on **regular** delivery days only—please see that books to be returned are tied together, and marked **"For Museum Wagon"** as driver can not be expected to pick up loose books lying somewhere near museum material.

Experience has shown best results with the least loss of time in those schools where principals have placed some one of their assistants in complete charge of the museum material.

CARE OF THE MATERIAL.

All articles in the loan collections should be handled with the greatest care. This is absolutely necessary to keep the material in good condition and enable the teachers to use it for a long time. The museum possesses a number of duplicates but it would be difficult to replace some of the articles.

TEACHERS' READING ROOM AND LIBRARY.

In connection with the Museum, a Library and Reading room for the teachers of the St. Louis Public Schools has been opened in the Harris Teachers College Building. In this reading room will be found the best educational periodicals, and magazines. The Library contains:

Reference books giving information on all material in the museum.

Text-books and books on education, psychology, child study, school management, etc., published in the United States.

Educational works from other countries.

Reports published by the various governments on educational affairs in their countries.

HOURS DURING WHICH MUSEUM WILL BE OPEN.

The Museum and Library will be open from 9 a. m. to 5 p. m. every day throughout the year, except Sundays and Holidays.

The Museum and Library offer the teachers of the public schools of our city most valuable opportunities for self-culture and professional study.

The Board of Education has taken care to secure valuable material for the Museum and has incurred considerable expense in order to display it properly and to make it accessible to the schools. It is hoped that the teachers will make good use of the excellent opportunities the Museum offers them and their pupils. Every teacher will realize that the thousands of objects illustrating every branch in our curriculum will, if properly and extensively used, afford valuable means of making the lessons in the school room more interesting, intelligible and successful.

Very respectfully,

BEN BLEWETT,

Superintendent of Instruction.

LOAN COLLECTIONS

FOOD PRODUCTS.

REFERENCE BOOKS.

Beal—Foods and Beverages.
Chamberlain—How We Are Fed.
Chisholm—Commercial Geography.
Lewis—Modern Industries.
Toothaker—Commercial Raw Materials.

COLLECTION 1.

Wheat.

Cultivated in all countries having a temperate climate. One of the staple foods of the civilized world.

1. Wheat in heads, United States.
2. Wheat in heads, bearded, United States.
3. Red winter wheat, United States.
4. White spring wheat.
5. Frances and Barletta wheat, Argentine Republic.
6. Indian wheat, Egypt.
7. Pearl and Tuscan wheat, New Zealand.
8. Spelt, hard-grained variety of wheat, Western States.

COLLECTION 2.

Wheat Products.

1. Wheat before hulling.
2. Wheat after hulling.
3. Wheat hulls.
4. Wheat bran. Coarse outer coating of wheat which, after grinding, is separated from the flour by sifting or bolting.
5. Middlings. Coarser part of ground wheat.
6. Cracked wheat.
7. Flour.
8. Various wheat foods.

Illustrations of Wheat and Wheat Cultivation.

COLLECTIONS.

3. Stereoscopic views. Various phases of wheat industry in different countries.

4. Colored chart. The wheat plant and its parts.

COLLECTION 5.

Rye.

Cultivated in the north temperate zone. One of the staple bread-making cereals.

1. Rye in heads, two stages of development.
2. Spring rye, United States.
3. Winter rye, United States.
4. Rye, Portugal.

Illustrations of Rye and Rye Industry.

COLLECTIONS.

6. Stereoscopic views. Rye and its cultivation.

7. Colored chart. Rye plant and its parts.

COLLECTION 8.

Oats.

Confined to the temperate zones. Chiefly grown for food of horses and cattle. Important article of human food in the form of oatmeal.

1. Oats in heads, United States.
2. Big Four oats, Montana.
3. Oats, Argentine Republic.
4. Oats, Portugal.
5. Black Tartar oats, New Zealand.
6. White Tartar oats, New Zealand.
7. Sparrowbill oats, New Zealand.
8. Rolled oats.

Illustrations of Oats and Oatfields.

COLLECTIONS.

9. Stereoscopic views. Cultivation of oats in various countries.

10. Colored chart. The oat plant and its parts.

COLLECTION 11.

Indian Corn or Maize.

Native of Mexico. Cultivated in nearly all parts of the world. Best development in North America.

1. Corn on cob, Missouri.
2. Flint corn, yellow, Nicaragua.
3. Flint corn, white, Argentine Republic.
4. Flint corn, red, Mexico.

COLLECTION 12.

Corn Products.

1. Pearl hominy.
(Corn hulled and coarsely ground.)
2. Granulated hominy.
3. Cornmeal.
4. Corn starch.
5. Corn syrup, white.
6. Corn syrup, dark.

COLLECTION 13.

Corn Products.

Complete collection of 19 bottles showing various products of one factory from corn to vulcanized corn oil.

1. Corn grains.
2. Corn bran.
3. Refined grits.
4. Gloss starch.
5. Laundry starch.
6. Pearl starch.
7. Powdered starch.
8. Dextrin.
9. Climax sugar.
10. 70 per cent sugar.
11. Anhydrous sugar.
12. Corn syrup.
13. Neutral glucose.
14. Gluten feed.
15. American gum.
16. British gum.
17. Corn oil.
18. Corn oil cake.
19. Vulcanized corn oil.

COLLECTION 14.

Illustrations of Corn and Cornfields.

Stereoscopic views. Corn and corn industry.

COLLECTION 15.

Rice.

Cultivated in marshy lowlands throughout the torrid zone and in the temperate zones as far as the 36th degree of latitude. Staple food of greater number of people than any other grain.

1. Rice plant, Texas.
2. Rice plant, Nicaragua.
3. Rice unhulled, Madagascar.
4. Rice hulled, South Carolina.
5. Rice hulled and whitened, Mexico.
6. Glutinous rice, Siam.

COLLECTION 16.

Rice Products.

1. Rice flour.
2. Rich starch.
3. Wafers made from rice.

Illustrations of Rice and Ricefields.

COLLECTIONS.

17. Stereoscopic views. Various phases of the rice industry.

18. Colored chart. The rice plant and its parts.

COLLECTION 19.

Millet.

Native of the East Indies and North Australia. Cultivated in Southern Europe, Northern Africa and the western part of the United States. Principally used for stock feed. From the variety termed sorghum sugar and molasses are obtained.

1. Red millet, United States.
2. Black millet, United States.
3. Yellow millet, India.
4. Sorghum, stalk and blossom, United States.

COLLECTION 19a.

Stereoscopic views illustrating the Millet Industry.

COLLECTION 20.

Cane Sugar.

Obtained from sugar cane growing in all tropical and subtropical regions.

1. Sugar cane stalk, Honduras.
2. Sugar cane and blossom, Louisiana.
3. Cane sugar, raw, Louisiana.
4. Cane sugar, refined, Argentine Republic.
5. Raw sugar liquor.
6. White sugar liquor.
7. Various kinds of sugar.

COLLECTION 21.

Sugar.

Glass case showing the various stages of development of cane and beet sugar.

COLLECTION 22.

Beet Sugar.

Obtained from the sugar-beet cultivated throughout the temperate zones.

1. Sugar-beet seed, Nebraska.
2. Raw beet sugar, Kansas.
3. Refined beet sugar, Michigan.

COLLECTION 23.

Development of Beet Sugar.

1. Slices of sugar beet.
2. Diffusion juice.
3. Plain liquor.
4. Thick liquor.
5. White fill mass.
6. White sugar.
7. Green syrup.

8. Brown syrup.
9. Brown fill mass.
10. Brown sugar.

COLLECTION 24.

Other Sugars.

1. Maple sugar, obtained from the sap of the maple tree common to the temperate zone.
2. Grape sugar or glucose, found in most sweet fruits.
3. Stalk and blossom of the sorghum plant, a variety or millet, which yields sugar and molasses.
4. Corn sugar.

Illustrations of Sugar and Sugar Industry.

COLLECTIONS.

25. Stereoscopic views. Sugar industry in various countries.
26. Sugar Industry. Fifteen copies of one view—"Cutting the Sugar Cane. —Porto Rico."
27. Sugar Industry. Fifteen copies of one view—"Plantation and Sugar Mill —Porto Rico."
28. Colored chart. The sugar beet.

COLLECTION 29.

Clover and Alfalfa.

Clover is a low herb chiefly found in the temperate regions of the northern hemisphere.

Lucerne. Pasture and forage plant widely spread in temperate climates. In the Western United States it is extensively cultivated and known under the name of alfalfa.

1. Clover plant.
2. Alfalfa plant.
3. Alfalfa seed.

COLLECTION 30.

Hops.

Grow wild in most parts of the Northern United States and Europe. Used in the manufacture of beer.

1. Hops, plant.
2. Hops, blossoms.
3. Hops, compressed.

Illustrations of Hops and the Hop Industry.

COLLECTIONS.

31. Stereoscopic views. Cultivation of hops.
32. Colored chart. Hop plant and its parts.

COLLECTION 33.

Beans

Cultivated almost everywhere as food for man and animals.

1. Beans in pod, Nicaragua.
2. Black frijoles, principal food of the Mexicans.
3-4. Various kinds of beans, Central America.
5. Horse beans, Portugal and New Zealand.
6. Golden wax beans, Montana.
7-8. Various kinds of beans, Philippine Islands.
9. Dwarf beans, Argentine Republic.
10. Castor beans. Tropical regions. Yield oil which is used in medicine and as lubricant for fine machinery.

COLLECTION 34.

Peas and Lentils.

Pea, native of Italy. Cultivated in all temperate regions as food for man and beast.

Lentil, native of Southern Asia. Cultivated in Europe, Southern Asia and Northern Africa. Chief varieties: The French lentil and Egyptian vetch.

1. Green peas, Egypt.
2. Sugar peas, Western United States.
3. Lentils, Mexico and Philippine Islands.
4. Vetch, Egypt

Illustrations of Beans, Peas and Lentils.

COLLECTIONS.

35. Stereoscopic views. Cultivation of beans and peas.
36. Colored chart. The Pea, plant and its parts.

COLLECTION 37.

Coffee.

Seed of the coffee plant cultivated in Arabia, Liberia, West Indies, Central America and Tropical South America.

1. Branch of coffee tree with fruit and leaves. Brazil.
2. Coffee in berry, Mexico and Nicaragua.
3. Coffee in parchment hull, Costa Rica and Mexico.
4. Coffee, hull removed, Nicaragua, Arabia and Liberia.
5. Coffee parched.

COLLECTION 38.

Preparation of Coffee.

Twelve bottles showing various stages of preparation of coffee from the tree to the coffee ready for use.

Illustrations of Coffee and Its Cultivation.

COLLECTIONS.

39. Stereoscopic views. Various phases of the coffee industry.

40. Coffee Industry. Fifteen copies of one view—"Coolies Picking Coffee.—Ceylon."

41. Coffee Industry. Fifteen copies of one view—"Coffee from Porto Rico—Havana Wharf, Cuba."

COLLECTION 42.

Coffee.

Glass case showing the various stages of development of coffee. Also coffee leaf and blossom.

COLLECTION 43.

Substitute for Coffee.

Chicory.

Obtained from the chicory root, extensively cultivated in France, Germany, and, of late, in the United States.

1. Chicory root.
2. Chicory roasted, ground and pressed.

COLLECTION 44.

Tea.

Leaves of the tea plant. Native of Eastern China. Cultivated in Eastern and Southern Asia, Brazil, Mexico and in the Southern United States. Mate tea is made from the leaves of a holly tree, growing in Central South America.

1. Tea plant, India.
2. Black tea, India, Japan, Ceylon, China.
3. Green tea, China.
4. Mate or Paraguay tea, Argentine Republic.
5. Various kinds of tea.

Illustrations of Tea and Tea Industry.

COLLECTIONS.

45. Stereoscopic views. Various phases of tea industry in different countries.

46. Three photographs. The tea plant and its parts.

COLLECTION 47.

Cacao.

Beans of a small tree, native of Columbia. Grown extensively in the northern part of South America, Mexico, the West Indies and East Indies. Used in the manufacture of chocolate.

1. Cacao pod, Brazil.
2. Cacao beans.
3. Cacao pulverized
4. Bitter chocolate.

COLLECTION 48.

Chocolate.

Glass case showing various stages of the manufacture of chocolate. Also cacao leaf and blossom.

COLLECTION 49.

Illustrations of Cacao and Its Industry.

Stereoscopic views illustrating cacao cultivation and industry.

COLLECTION 50.

Cocoanut.

Fruit of the cocoa palm cultivated in all tropical countries. The nut is used as food and for the production of cocoanut oil and butter. The fibers covering the nut are employed in filling mattresses and made into cordage and matting. From the shell various implements are made, and the leaves furnish material for thatching, brooms, baskets and mats.

Cocoanut.

1 Cocoanut in outer shell.
2. Cocoanut, outer shell removed.
3. Section of outer shell showing fiber.

COLLECTION 51.

Food Products Obtained from Fruit of Cocoanut.

1. Cocoanut butter.
2. Cocoanut oil.
3. Cocoanut, shredded.
4. Copra, dried kernel of nut.
5. Poonac, cocoanut meat pressed—used for cattle food.
6. Soap made from cocoanut oil and extracts.

COLLECTION 52.

Cocoanut Fiber and Its Products.

1. Mattress fiber.
2. Bristle fiber.
3. Bristle fiber, colored.
4. Yarn made of cocoanut fiber.
5. Rope made of cocoanut fiber.
6. Mat made of cocoanut fiber.

COLLECTION 53.

Cocoanut Palm Leaves and Bark.

1. Inner bark of cocoanut palm.
2. Bag made of cocoanut palm leaves.
3. Mat made of cocoanut palm leaves.

COLLECTION 54.

Implements Made of Cocoanut Shell.

1. Ladles.
2. Dipper.
3. Bowl.

Illustrations of Cocoanut and Its Industry.

COLLECTIONS

55. Stereoscopic views. Various phases of cocoanut industry.

56. Cocoanut Industry. Fifteen copies of one view—"The Cocoanut Tree."

57. Cocoanut Industry. Fifteen copies of one view—"Natives in a Cocoanut Grove."

COLLECTION 58.

SPICES.

Cinnamon.

Inner bark of branches of cinnamon tree, native of Ceylon. Cultivated in Ceylon and the West Indies.

1. Cinnamon bark.
2. Cinnamon quills, the bark closely rolled, in various sizes.
3. Cinnamon fiber.
4. Cinnamon chips.
5. Cinnamon, ground.
6. Cinnamon oil, distilled from the bark of the cinnamon tree.

COLLECTION 59.

Cassia.

Inner bark of cassia or Chinese cinnamon tree. Used as substitute for cinnamon.

1. Cassia buds, Saigon.
2. Cassia quills, Canton, Batavia.
3. Cassia quills of various sizes, Saigon.

COLLECTION 60.

Implements Used in the Preparation of Cinnamon.

Eight instruments used by the Singalese women in the preparation of cinnamon.

COLLECTION 61.

Pepper.

Fruit of pepper plant, native of Southern India. Cultivated in Southeastern Asia and the West Indies. Red pepper is the dried fruit of the capsicum or cayenne pepper plant growing in tropical America.

1. Black pepper, Singapore.
2. White pepper, India.
3. Mexican chili.
4. Red pepper in pods, Japan, Soudan.
5. Long peppers, Siam.
6. Black and red pepper fiber.
7. Black and white bran.
8. Black, white, and red pepper, ground.

COLLECTION 62.

Illustrations of Pepper and Pepper Culture.

Large colored chart showing pepper plant culture.

COLLECTION 63.

Mustard.

Seed of mustard plant. Black mustard found wild in Central and Southern Europe, Southern Asia, and North Africa. Cultivated in North and South America. White mustard grows in Southern Europe and Western Asia.

1. Mustard seed, yellow, England and Portugal.

2. Mustard seed, brown, Austria.
3. Mustard, ground.
4. Mustard bran.
5. Mustard cake.

COLLECTION 64.

Various Spices.

1. Thyme. A warm, pungent, aromatic herb used to give a relish to meats.

2. Sage. A plant of grayish green foliage used in flavoring meats.

3. Marjoram. A genus of mint like plants comprising about twenty-five species. Sweet marjoram is fragrant and much used in cookery.

4. Savory. A plant used in cooking also called summer savory.

5. Dill. An aromatic herb, the seeds of which are used in cooking and were formerly used as a soothing medicine for children.

6. Celery Seed and Salt. A plant of the Parsley family, the blanched stalks of which are used. The seed has a taste similar to the plant.

7. Caraway Seed. These have an aromatic smell and a warm, pungent taste. Used in cooking and medicine.

8. Poppy Seed. Used in cooking. From these opium is obtained.

9. Bay Leaves. Leaves of the Bay Tree.

10. Laurel Leaves. Leaves of an aromatic evergreen tree. Used by the early Greeks to crown the victor in the Olympian Games.

11. Curry. A powder formed of strong spices. Much used in India.

COLLECTION 65.

Various Spices.

1. Ginger. Root stock of plant cultivated in Southeastern Asia, Western Africa and Tropical America.

2. Cloves. Dried flowerbuds of the clove tree, native of the Moluccas, cultivated in almost all tropical regions.

3. Allspice. Dried fruit of allspice or pimento tree, West Indies.

4. Anise. Seed of tree native of Egypt. Cultivated in Syria, Malta, Spain, Germany, and Mexico. Star anise found in Anam and China.

5. Nutmeg. Kernel of fruit of nutmeg tree. Native of the Moluccas but cultivated in all tropical countries.

6. Mace. Dried inner coating investing shell of nutmeg.

7. Cardamom. Capsule and seed of an Indian spice plant, cultivated in Southern Asia and Madagascar.

8. Coriander. Used also in Medicines.

COLLECTION 66.

Vanilla.

1. Vanilla bean. Tropical regions. Fruit of the vanilla plant, belonging to the orchid family. Capsule remarkable for its fragrant odor and the volatile oil extracted from it.

2. Vanilla Extract.

COLLECTION 67.

Various Food Products.

Tapioca, Jamaica.

Starchy food obtained from the tubers of the manioc or cassava plant, a native of the West Indies and Tropical South America.

1. Flake tapioca.
2. Pearl tapioca.
3. Cassava Starch, from the tubers of the Cassava Plant.
4. Sweet Potato Starch obtained from the tuber of the sweet potato plant.
5. Arrow-root meal. Obtained from the root of maranta, a herbaceous plant growing in the East and West Indies and Africa. Used as food.
6. Banana meal. Obtained by drying and grinding fruit of banana plant cultivated exclusively in tropical regions.
7. Sago. The soft inner portion of sago palm. Cultivated in Southeastern Asia.

NUTS AND FRUITS.

COLLECTION 68.

Nuts and Fruits.

1. Peanut. Shrub with nuts. Fruit of peanut plant belonging to family Leguminosae. Warmer parts of Asia and America. Common in South Carolina and Georgia. Nuts yield oil used as substitute for olive oil.

2. Pecan. A species of Hickory growing in the Mississippi Valley and Texas.

3. Chinquapin. A nut-bearing shrub allied to the Chestnut. Grows from 6 to 20 feet high in various parts of North America.

4. Para or Brazil nut. Tropical regions of South America. Nuts to the

number of 25 or 50 tightly packed in hard, woody shell. "Niggertoes." Used as food and yield fine oil.

5. Algarrobe. Brazil and Argentine Republic. Fruit of Algarrobe tree, pulse family. When dried and ground, used for making bread called "patay," an excellent food which is largely consumed by rural population.

6. Betel nut. Fruit of Areca palm. Tropical Asia. Nut cut in slices, wrapped in the aromatic leaves of betel pepper, is chewed by the natives of Eastern Asia.

COLLECTION 69.

Nuts.

Ivory Nut or Vegetable Ivory. Fruit of a palm in Northwestern South America. Very large, containing six or seven seeds. Fruit at first soft and juicy, becomes very hard at a later stage. When dried becomes as white and hard as ivory. Used for making buttons and small ornaments.

1. Ivory burr, containing seeds or nuts.
2. Nuts in various stages of growth.
3. Buttons and ornaments made of ivory nuts.

COLLECTION 70.

Nuts.

Glass case showing development of Button from Ivory Nut.

COLLECTION 71.

Nuts and Fruits.

1. Job's Tears. Fruit of grasses growing in East India and Japan. Used as ornaments.
2. Jumbee Beans. Fruit of Ormosia or Necklace tree. Tropical regions. Used as beads for necklaces.
3. Attalea Nut. Brazil. Fruit of Piassava palm.

WAXES.

REFERENCE BOOKS.

Patton—The Teacher's Aid.
Toothaker—Commercial Raw Materials.

COLLECTION 72.

Animal and Vegetable Waxes.

Animal Wax. Yellow or brown substance secreted by honey bees from the pollen of flowers. Used for many purposes.

1. Bees' Wax. United States.
2. Bees' Wax. Madagascar.

Vegetable Wax. Hard wax-like substance obtained from the fruits of the Rhus plant growing in Japan.

3. Branch of Rhus plant with fruit.
4. Japan Wax made from the fruit of Rhus plant.
5. Bayberry Wax. Found coating the fruits of several species of myrtle-bushes. United States, Central and South America. Obtained by plunging berries into hot water and skimming off the wax which rises to the surface. Used in combination with beeswax for making candles.

OILS.

REFERENCE BOOKS.

Patton—The Teacher's Aid.
Toothaker—Commercial Raw Materials.

COLLECTION 73.

Oils: Animal Oils.

Obtained from the fat of various animals by melting the fatty tissues.

1. Herring oil.
2. Cod oil.
3. Sardine oil.
4. Shark oil.
5. Whale oil.

COLLECTION 74.

Oils: Vegetable Oils.

Obtained from the seeds or other parts of various plants. The parts of the plant rich in oil are either crushed, or the oil is extracted by means of chemicals.

1. Cotton-seed Oil. Used for burning in lamps, soap-making and lubricating. Also used as substitute for olive oil.
2. Linseed Oil. Used in the manufacture of paint and varnish, printers' ink and for various other purposes.
3. Cocoanut Oil. Used to make cocoanut butter and in making candles and soap.
4. Cinnamon Oil. Distilled from bark of cinnamon tree.
5. Sesame Seeds and Oil. Obtained from sesame plant, cultivated in Egypt and India. Substitute for olive oil. Also used for soap making, lamp oil, lubricating and medicine.

To the Teacher:—

Use this blank page to insert additional collections 75 to 100, to be given in future Supplementary Catalogues.

COLLECTION **33-a.**

Soy Beans.

Soy-beans or Soy-peas are made into a sauce and variously used in cookery; an oil is also expressed from them, and the residue is used for feeding cattle and as a fertilizer. The plant is native from Northern India to Japan.

1. Soy-bean—Tokyo.
2. Soy-bean—Shanghai.
3. Soy-bean—Ito San.
4. Soy-bean—Haberlandt.
5. Soy-bean—Hollybrook.
6. Soy-bean—Baird.
7. Soy-bean—Acme.
8. Soy-bean—Mammoth.
9. Soy-bean—Brownie.
10. Soy-bean—Cloud.
11. Soy-bean—22644.
12. Soy-bean Meal.

COLLECTION **45-a.**

Illustrations of Tea Culture.

Large colored chart showing tea plant, its culture and process of drying.

MATERIAL FOR CLOTHING.

REFERENCE BOOKS.

Chisholm—Commercial Geography.
Hanan—Texile Fibers of Commerce.
Lyde—Man and His Markets.
Toothaker—Commercial Raw Materials.

COLLECTION **100.**

Cotton.

Fibrous portion of fruit of cotton plant. Cotton most extensively used is that cultivated in the southern part of the United States from Virginia to Texas.

1. Cotton bolls, Louisiana.
2. Cotton, unginned, Texas.
3. Cotton, ginned, Arkansas and Mexico.
4. Cotton seeds.
5. Cotton seed linters.
6. Miniature cotton bale.

COLLECTION **101.**

Cotton of Other Countries.

1. Sea Island cotton, West Indies.
2. Peruvian or Kidney cotton, Peru.
3. Silk cotton obtained from the Bombax or cotton tree, Honduras and Venezuela.
4. Pods of cotton tree, Philippine Islands.

COLLECTION **102.**

Other Cotton Products.

1. Cotton seed oil. Substitute for olive oil; also used for burning in lamps, soap-making and lubricating.
2. Cotton oil cake. Used as cattle food and fertilizer.
3. Cotton seed meal. Ground cotton seed cake.
4. Cotton Seed meat. Cattle food.
5. Cotton seed oil soap and soap powder.
6. Cottolene. Cooking fat obtained from cotton seed oil.
7. Varieties of Paper made from Cotton Stalks. The bark is separated from the stalk, carded and heckled, and changed into a pulp from which paper is made.

COLLECTION **103.**

Manufacture of Cotton.

Glass case showing the various stages of manufacture of cotton goods.

Illustrations of Cotton and Cotton Industry.

COLLECTIONS.

104. Stereoscopic views. Cotton industry of various countries.

105. Cotton Industry—Fifteen copies of one view—"Cotton pickers in the Field."

106. Cotton Industry—Fifteen copies of one view—"Cotton on the Levee—New Orleans."

COLLECTION **107.**

Wool.

The wools of commerce are the product of many distinct varieties of the fleece of the sheep, among them the Merino, the Lincoln, and the Rambouillet. Next to cotton the most important of all textile fibers.

1. Merino wool, unwashed.
2. Merino wool, washed.
3. Half-breed Merino, unwashed.
4. Cross Lincoln wool, Argentine Republic.
5. Rambouillet wool, Argentine Republic.

COLLECTION **108.**

Processes of Wool Manufacture.

1. Shoddy (shredded rags of woolen fabrics) to be mixed with dyed wool.
2. Black and white wool and shoddy mixed.
3. Rovings from carding machine.
4. Spun yarn.
5. Various woolen fabrics.

COLLECTION **109.**

Vegetable Wool.

Obtained from the wool tree (eriodendron) found in tropical America. Wool too short and brittle to be spun. Used for filling mattresses and pillows.

1. Vegetable wool, Peru and Mexico.
2. Vegetable wool on branch, Nicaragua.

COLLECTION **110.**

Processes of Wool Manufacture.

Glass case showing the various processes in the manufacture of woolen yarn.

Illustrations of Wool and Wool Industry.

COLLECTIONS.

111. Photographs. Herds of sheep in the pampas.

112. Stereoscopic views. Sheep and the wood industry.

COLLECTION **113.**

Silk.

The fiber spun by the silk moth, native of China. The principal silk-producing countries are China, Japan, India, France and Spain.

1. Silk moth.
2. Silk cocoons, China and Japan.
3. Raw Silk.
4. Bolting Cloth. Used in flour mills for sifting flour. The seams in the cloth show the places where the cloth had been fastened to the frame in the reel.
5. Silk rovings to be spun into yarn.
6. Silk waste for silk and wool mixed goods.
7. Various silk fabrics.
8. Glass case showing the development of silk.
9. Booklet explaining Silk manufacture.

COLLECTION **114.**

Silk.

Silk Industry.—Fifteen copies of Booklet—"Silk its Origin, Culture and Manufacture."

Illustrations of Silk Industry.

COLLECTIONS.

115. Stereoscopic views. Silk industry in various countries.

116. Silk Industry—Fifteen copies of one view—"Separating Cocoons from their Nests—Japan."

117. Silk Industry—Fifteen copies of one view—"Gathering Mulberry Leaves for Silkworms."

Flax.

REFERENCE BOOKS.

Hanan—Texile Fibers of Commerce.

Toothaker—Commercial Raw Materials.

Principal Commercial Plant Fibers—Yearbook of U. S. Department of Agriculture, 1903.

COLLECTION **118.**

Flax.

The flax plant is found in nearly every country of Europe and in the temperate regions of Asia, Africa, North and South America. In European countries it is cultivated chiefly for its fiber which is spun into linen, in India and America for the seeds from which linseed oil is obtained.

1. Flax plant.
2. Flax fiber.
3. Flax fiber fabrics.

COLLECTION **119.**

Flax Seed and Its Products.

1. Flax seed.
2. Flax seed, ground.
3. Linseed oils.
4. Linseed oil cake.

Illustrations of Flax and Flax Industry.

COLLECTIONS.

120. Stereoscopic views. Various phases of the flax industry.

121. Flax Industry—Fifteen copies of one view—"Flax taken from stacks to soak in river—Belgium."

COLLECTION **122.**

Spinning wheeel.

COLLECTION **123.**

Hemp.

Bast fiber of hemp plant, cultivated in Russia and Southern Europe, China, Japan, and the United States. Used for making cordage, ropes, linen crash, homespuns, etc. The seed is used as food for cage birds.

1. Hemp seed.
2. Hemp fiber.
3. Hemp fabrics.

Reference Book: Yearbook of Department of Agriculture, 1903.

COLLECTION **124.**

Jute.

Obtained from a plant belonging to the linen family. Cultivated in India, China and Japan. Used for making twine, bagging, rugs, carpets, and burlap.

1. India jute fiber.
2. Chinese jute fiber.
3. Burlap.

4. Jute plant pressed.
5. Jute stalk.
6. Jute after dressing.
7. Jute cuttings for making paper.
8. Jute yarn.
9. Jute rope.
10. Jute bagging.

Reference Book: Yearbook of U. S. Department of Agriculture, 1903.

COLLECTION 125.

Illustrations of Jute Industry.

Stereoscopic views. Cultivation and manufacture of jute.

COLLECTION 126.

Fibers of the Philippine Islands.

MANILA HEMP AND PINA FIBER.

Manila hemp is obtained from the leaf sheaths of a banana plant. Used for making rope, ships' cables and other marine cordage, hoisting rope, etc.

Pina fiber is obtained from the leaves of a species of pineapple. Used for delicate fabrics like shawls, scarfs, etc.

1. Manila hemp fiber.
2. Fabrics of manila fiber.
3. Pina fiber.
4. Pina muslin.

Reference Book: Yearbook of U. S. Department of Agriculture, 1903.

COLLECTION 127.

Illustrations of Manila Fiber.

Stereoscopic views. Various phases of manila fiber industry.

COLLECTION 128.

Fibers Obtained from the Agave Plant.

The leaves of the agave grown in all tropical countries yield a strong fiber used for binders' twine, lariats and general cordage.

1. Sisal fiber, Mexico.
2. Maguey fiber and rope, Nicaragua.
3. Heneguin fiber and rope, Yucatan.
4. Agave fiber, Venezuela.
5. Mauritius hemp, Mauritius.
6. Jaumave Istle fiber, Mexico.

COLLECTION 129.

New Zealand Flax.

Obtained from plant belonging to the lily family. Manufactured into twine, rope and cordage, and spun and woven into goods closely resembling linen.

1-2. New Zealand flax and rope.

Cocoanut Fiber.

See Collection 52.

COLLECTION 130.

Tree Bast Fibers.

From the inner layers of the bark of linden and other trees. Used for rough cordage, mats, bags and baskets. Ramie or China grass is obtained from the inner bark of a nettle plant, cultivated in China, Japan, and the East Indies. Used for making stockings, sheeting, shirtings, napkins, table damask, carpets, fishing nets, yarn and thread.

1. Branch of tree showing fiber, Madagascar.
2. Cocoanut bast fiber, Ceylon.
3. Tappa cloth, made of the inner bark of the tappa, a mulberry tree, Hawaiian Islands.
4. Ramie, dark colored, Formosa.
5. Ramie, light colored, Formosa.
6. Linden bast rope, Russia.
7. Linden bast bagging, Russia.
8. Shoes made from linden bast fibers, Russia.
9. Matting made from linden bast fibers, Russia.

COLLECTION 131.

Palmetto Fibers.

1. Plaster board fiber. Southern States. The finer fiber extracted from leaf stems of the saw palmetto, native of the Southern States, and utilized in making of staff and in plastering instead of hair.
2. Palmetto root fiber. Southern States. The root of the cabbage palmetto is sawed crosswise into disks and the pulp scraped away with toothed wheels. This leaves the fibers exposed as bristles.
3. Section of palmetto root.
4. Section of palmetto root, showing fiber.
5. Brushes and whisks made from cabbage palmetto fiber.

COLLECTION 132.

Bamboo.

A tall, bushy or arborescent grass, with wooden stems, native of Eastern Asia. It varies in thickness from that of a goose's quill to more than a foot in diameter, and in height from a few to 150 feet. The stem of the bamboo affords to the inhabitants of Eastern Asia the material for the erection and furnishing of the ordinary dwelling home and for many other purposes.

1. Various specimens of bamboo.
2. Bamboo. Fiber. Spliced stems of bamboo.
3. Rope made of Bamboo Fiber.

COLLECTION 133.

Rattan.

1. Rattan. Stem of palm (calamus), native of the East Indies. Used for basketry, ropes, furniture, canes, etc. In preparing rattan cane for the market, the natives remove the leaves and outer cuticles by pulling the stems through a notch in a tree or board.
2. Cane made of rattan.

COLLECTION 134.

Pine Needle Fibers.

Obtained from needles of long-leafed pine in Southern States. The needles are laid out to dry, then placed in large iron cylinders where the oil is extracted by steam, and then put into vats with water and alkali, which removes the silicious hardening matter. The straw is soaked for two days, when, with the water, it is fed through a machine which extracts the fiber.

1. Pine needles.
2. Bagging made from pine needle fiber.
3. Matting made from pine needle fiber.
4. Rope made from pine needle fiber.

COLLECTION 135.

Palm Fibers and Leaves.

Raffia. From the young leaflets of a palm, native of Madagascar. Cultivated in West Africa and Brazil Used to make hats and baskets and woven into mattings and tapestry.

Piassava or monkey grass. Obtained from the leaf sheaths of the piassava palm found in Brazil. Used for brooms, rope and mats.

Pita fiber. From the leaves of the pita palm, Mexico and Peru. Used in making cordage.

1. Raffia fiber, Madagascar.
2. Raffia fiber, colored, Madagascar.
3. Piassava fiber, Brazil.
4. Piassava rope, Brazil.
5. Pita fiber, Peru.
6. Palm leaves, Madagascar and Ceylon.
7. Baskets of palm leaves, Nicaragua.

To the Teacher:—

Use this blank page to insert additional collections 136 to 150, to be given in future Supplementary Catalogues.

COLLECTION **129-a.**

Various Fibers.

1. Sisal fiber obtained from a species of agave, commonly known as heniquen, grown in Yucatan and Mexico. It is almost identical with the century plant.
2. Sisal sliver or strand prepared for spinning.
3. Sisal twine.
4. Manila fiber or abaca, obtained in the Philippines from the Manila tree, a species of the banana.
5. Manila sliver or strand prepared for spinning.
6. Pure Manila twine.
7. Flax fiber grown in every state of the Union, and made from the straw which formerly went to waste.
8. Flax twine.

DOMESTIC WOODS.

REFERENCE BOOKS.

Apgar—Trees of North America.
Hough—Hand Book of Trees of Northern U. S. and Canada.
Keeler—Our Native Trees.
Lounsberry—A Guide to the Trees.
Matthews—Familiar Trees.
Rogers—Tree Book.
Stokes.—Ten Common Trees.

The collections of domestic woods are mounted on slides, each of which shows a piece of bark, a longitudinal and a cross-section of branch, the blossom, the leaf and the fruit of a tree.

COLLECTION 150.

Domestic Woods.

Woods of the following trees:

1. Horse Chestnut. Throughout Europe and the United States. Wood coarse, easily split and durable. Used for railroad ties and fence posts.

2. Linden or Basswood. Northern and Middle States. Fiber obtained from inner bark used for making ropes and matting. Wood much used in cabinet work.

3. Papaw. Central United States. Along streams. Fruit yellowish and fragrant.

4. Beech. Abundant in the Northern United States and Canada. Wood hard and heavy; used for many economic purposes.

5. Willow. Growing in damp places throughout the United States. Wood soft; used for carpentry and fuel; branches for basketry.

6. Poplar. Sandy soil. Throughout the United States. Wood white and soft and used for coarse work only.

7. Silver Poplar. A native of Europe, Asia and Africa has become naturalized throughout Northeastern United States and Canada.

8. Cottonwood. Variety of poplar. Mississippi Valley.

COLLECTION 151.

Domestic Woods.

Woods of the following trees:

1. Sumach. Very common along fences and on hillsides throughout the United States. Wood orange colored and brittle. Used for dyeing.

2. Locust. Throughout the United States. Wood close grained and valued for its strength, durability and elasticity.

3. Red Bud. Central United States. Wood hard and heavy.

4. Black Haw. Northern United States and Canada. Wood hard and heavy; used in turnery and for fuel.

5. Sweet Gum. Low, moist bottom lands of Central United States. Each layer in the bark represents a season's growth. Wood used for interior finish.

6. Dogwood. Central United States. Bitter tonic bark. Hardwood used in turnery.

7. Persimmon. Central and Southern United States. Fruit of pleasant taste after frost. Wood very hard and dark colored.

8. Box Elder. Throughout United States. Yields sugar. Wood light and soft; used for interior finish, woodenware, paper pulp, etc.

COLLECTION 152.

Domestic Woods.

Woods of the following trees:

1. Ash. United States and Canada. Moist woods and swamps. Wood is light, elastic and durable, and used for carriage frames and agricultural implements.

2. Catalpa. Southern and Western States. Low, rich woodlands. Wood light, coarse grained, and very durable.

3. Sassafras. Central United States. Root aromatic, used in medicine. Wood reddish, rather hard and durable.

4. Elm. Northern United States. Favorite shade tree. Wood tough and strong; used for carriages and in shipbuilding.

5. Hackberry. Throughout North America. Wood quite tough. Used for barrel hoops and for charcoal.

6. Mulberry. Central and Southern States. Leaves used for feeding silk worms. Wood yellow, heavy, and durable.

7. Sycamore. Common in the United States east of the Rocky Mountains. Wood hard and compact; used for furniture and interior decoration.

8. Birch. Northern United States, rocky and mountainous woods. Wood hard and close grained; used for spools, shoe pegs, wood pulp and barrel hoops.

COLLECTION **153.**

Domestic Woods.

Woods of the following trees:

1. Butternut or White Walnut. Common in Northern and Central United States. Wood used for gun stocks, panels, and veneers.

2. Black Walnut. Middle and Western States. Wood used in building and for cabinet work.

3. Shellbark Bitternut Hickory. Central United States; rough and shaggy bark. Wood used in making hoops, axe handles, the keels of vessels, etc.

4. Pecan. The largest of the Hickories. Its nuts form an important article of commerce. It prefers low rich ground near streams.

5. Sugar or Rock Maple. United States, most abundant in New England. Yields maple sugar. Wood heavy, hard and strong. Used for fuel and cabinet work.

6. Red Maple. Low woods and swamps in the Atlantic States. Wood hard and compact, much used in cabinet work.

7. White or Silver Maple. Southern States. Wood not as hard as that of the other maples. Used for cabinet work and interior finish.

COLLECTION **154.**

Domestic Woods.

Woods of the following trees:

1. Black Oak. Throughout the United States. Bark used for dyeing and tanning. Wood used for building, cabinet work and furniture.

2. Black Jack Oak. Variety of black oak found in the Central States.

3. Red Oak. Most common species of the oak family in the United States and Canada. Bark used in tanning. Wood reddish and coarse grained, of little value as timber, but excellent for fuel.

4. White Oak. Common throughout the United States. Bark used for tanning. Yields valuable lumber used in building, for cabinet work, and furniture.

5. Post Oak. Variety of white oak found in the Southern and Central States.

6. Burr Oak. One of the very largest American oaks. Prefers rich bottom-lands. Bears large acorns with mossy-fringed cups.

7. Pin Oak. One of our most beautiful oaks, with clear cut leaves, and smooth, grayish column or trunk.

8. Laurel Oak. Frequently called water oak. Especially popular as a shade tree in the Southern States.

COLLECTION **155.**

Domestic Woods.

Woods of the following trees:

1. White Pine. Most valuable timber tree. Eastern United States and Canada. Used in building. The large trunks made into ship masts.

2. Yellow Pine. Southern United States. Yields resin and valuable lumber.

3. Spruce. Forms forests in Northern United States and Canada. Wood light and soft; used in building, for sounding boards of pianos, violins, etc.

4. Hemlock. Northeastern United States. Wood used in building, for fences, plank walks, etc., Bark used for tanning.

5. Fir. Eastern and Western North America. Bark yields fir balsam. Wood light, soft and white; used for masts and spars.

6. Red Cedar. Common cedar tree of the United States. Wood has pleasant odor and is almost exclusively used in the making of lead pencil frames.

7. Arbor Vitae or White Cedar. Planted largely for ornamental purposes, does well in hedges for windbreaks.

8. Cypress. A swamp loving tree, valuable for cooperage, tank construction and other commercial purposes.

Illustrations of Many of the Trees of the Preceding Collections.

Colored charts showing various domestic trees, their bark and leaf, with brief description.

COLLECTIONS.

156. Locust.
157. Birch.
158. Poplar.
159. Ash.

160. Horse Chestnut.
161. Alder.
162. Plane Tree.
163. Lime Tree.
164. Spruce.
165. Fir.
166. Holly Oak.
167. English Walnut.

COLLECTION 168.

Illustrations of Lumber Industry.

Stereoscopic views. Illustrating Lumber Industry.

COLLECTIONS.

169. Lumber Industry—Fifteen copies of one view—"Scouring Logs and Hauling Them into Saw-Mill, Minneapolis, Minn."
170. Lumber Industry—Fifteen copies of one view—"Stupendous Log Raft."
171. Lumber Industry—Fifteen copies of one view—"Driving Logs Through a Narrow Channel."

COLLECTION 172.

Forestry.

Ten Pamphlets—"A Primer of Forestry—Part 1.—The Forest," by Gifford Pinchot.

COLLECTION 173.

Forestry.

Ten Pamphlets—"A Primer of Forestry—Part II.—Practical Forestry," by Gifford Pinchot.

COLLECTION 174.

Forestry.

Thirty Pamphlets—"The Use of the National Forests," by Gifford Pinchot.

MODELS OF PLANTS.

Enlarged Models of plants made of papier-mache and glass, showing all parts of the plant.

COLLECTION 175.

Scotch Fir. Coniferae.

COLLECTION 176.

Rye, Gramineae.

COLLECTION 177.

Orchid, Orchidaceae.

COLLECTION 178.

Birch, Cupuliferae.

COLLECTION 179.

Hazel-nut, Capuliferae.

COLLECTION 180.

Rape, Cruciferae. Blossom and seed pod.

COLLECTION 181.

Pea, Leguminosae. Blossom and seed pod.

COLLECTION 182.

Bean, Leguminosae.

COLLECTION 183.

Cypress Spurge, Euphorbiaceae.

COLLECTION 184.

Grape-vine, Vitaceae.

COLLECTION 185.

Sage, Labiatae.

COLLECTION 186.

Toad-flax, Scrophulariaceae.

COLLECTION 187.

Fox-glove, Scrophulariaceae.

COLLECTION 188.

Dandelion, Compositae.

COLLECTION 189.

Chamomile, Compositae.

COLLECTION 190.

Meadow Saffron, Melanthiaseae.

COLLECTION 191.

Equisetum, Horse-tail, Equisetaceae. Blossom and seed pod.

COLLECTION 192.

Venus Fly-trap, Droseraceae.

COLLECTION 193.

Worm-fern Proth, Filices.

MEDICINAL PLANTS.

COLLECTION 194.

Plants.

1. Cinchona or Peruvian Bark. Bark of the Cinchona plant growing in Peru and Bolivia. From it quinine is obtained.

2. Sassafras. Bark of the Sassafras. Tree of the Laurel Family. United States and Central America. Aromatic. Used in medicine as a tonic.

3. Balsam. West Indies and Central America. Thick aerial roots sent down from the stems and branches of small trees. Produce fragrant gum—resin used in medicine.

4. Ipecac. Root of a plant belonging to the Cinchona family. Native of Brazil. Roots highly valued in treatment of dysentery.

5. Jalap. Tuberous root of a climbing plant of Central America and Mexico. Used as a purgative.

6. Cascarilla Bark. Small tree of the Spurgewort family. West Indies and Central America. Produces a bitter tonic.

OTHER TREE PRODUCTS.

CORK.

REFERENCE BOOK.

Patton—The Teacher's Aid.
Toothaker—Commercial Products.

CORK.

Outer bark of the cork oak found in Southern Europe and Northern Africa. Used for stoppers for bottles and casks. for artificial limbs, for inner soles of shoes, for floats of nets, etc.

COLLECTION 195.

Cork Bark.

1. Cork bark in natural roughness, Portugal.
2. Cork ready for the market, Portugal.
3. Cork strips, Portugal.

COLLECTION 196.

Processes Showing Manufacture of Cork Products.

Cork punching. Handcut cork.
Cork tapering. Split cork.
Cork glueing.

COLLECTION 197.

Cork Products.

Cork paper. Cork handle.
Cork wood. Cork soles.
Cork caps and stoppers.
Cork fish bobbers.
Cork seine.
Model of sheet cork insulation.

COLLECTION 198.

Cork.

Case showing the Development of Cork Products.

COLLECTION 199.

Rubber.

India rubber is obtained from the milky sap of several plants found in the tropical and subtropical regions. Used for rubber bands, toys, boots, carriage tires, hose, waterproof tissues, rubber stamps, stoppers, etc.

1. Crude rubber. Two varieties.

Illustrations of Rubber Industry.

COLLECTIONS.

200. Stereoscopic views. Various phases of the rubber industry.

201. Large colored chart. Showing India rubber culture.

COLLECTION 202.

Gutta Percha.

Gutta Percha. Plant product similar to rubber. Obtained from the milky juice of Sapota trees found in the East Indies. Malay Peninsula and other tropical countries. Chiefly used for articles exposed to moisture, cold, and acids, as hose, belts, buckets and as insulating material for electrical wires.

COLLECTION 203.

Gutta Percha.

Case showing the development of Gutta Percha products.

COLLECTION 204.

Gums and Resins.

1. Gum Arabic. The sap of a species of Acacia and other thorny shrubs found in Northeast Africa and portions of Asia. Used for mucilage, in the manufacture of ink and blacking, and in making confectionery.

2. Copal. A resin obtained from the sap of the copal trees found in West Africa, Zanzibar and Brazil. Large quantities are found in a fossil state. Used for making varnish.

(a) Zanzibar copal.
(b) Congo copal.
(c) Angola copal.
(d) Brazilian copal.

3. New Zealand Kauri. A resin gained from living trees and found in a fossil state. Used in making varnish. The lighter shades are used as a substitute for amber.

4. Resin, Ceylon.

5. Elacterite, fossil resin found in Utah.

6. Rosin, obtained by distilling crude turpentine. Chief countries for its production are the United States, Russia, Austria, France and India. Used in making soaps, cheap grades of varnish, and for rubbing on violin bows.

COLLECTION 205.

Camphor.

White, volatile, gum-like camphor of penetrating odor and pungent taste. Obtained from the camphor tree, native of Eastern Asia. Transplanted to all tropical and subtropical countries.

Chips of camphor wood are put into stills with water, and the volatile camphor is driven off by the heat and crystalized. Used in medicine and in the making of varnish.

1. Camphor wood, Formosa.
2. Camphor chips, Formosa.
3. Granular camphor, Japan.
4. Camphor black oil, Formosa.
5. Camphor white oil, Formosa.
6. Camphor varnish, Formosa.

COLLECTION 206.

Tree Moss.

Tree Moss or Spanish Moss is found from South Carolina down to Argentine hanging in dense masses from the branches of trees. The outer cuticle is removed from the plant by machinery, and the remaining fiber resembling horse hair, is used for upholstering. The unprepared moss is used for packing material for fruit and glass.

1-4. Tree Moss in various stages of development.

COLLECTION 207.

Paper made from Wood Pulp.

From sections of spruce wood two feet long the bark is removed and the wood cut into chips. Chips are cooked with by-sylphite liquor into pulp which is bleached into white fiber. From the bleaching chests, the pulp is run into sheets on a dry machine or wound off into rolls.

1. Section of Log of Spruce Tree.
2. Spruce Chips used in the manufacture of Pulp.
3. Lime Chips used in the manufacture of Pulp.
4. Unbleached Sylphite Pulp.
5. Bleached Sylphite Pulp.
6. Roll of Paper made of Pulp.
7. Various Samples of Paper made of Pulp.

COLLECTION 208.

Illustrations of Paper Industry.

Stereoscopic views, illustrating Paper Industry.

COLLECTION 209.

Paper Industry.

Glass case, showing the various stages of development of Paper.

COLLECTION 210.

Blotting Paper.

Glass case, showing the various stages in the manufacture of Blotting Paper.

COLLECTION 211.

Rice Paper.

Various samples of Rice Paper—made from rice straw; also of paper made from the pith of the rice-paper tree of Formosa.

FOREIGN WOODS.

REFERENCE BOOK.

G. S. Boulger—Woods.

COLLECTION 212.

Foreign Woods: West Indies.

1. Ebony. Wood of large tree, native of Southern India. Deep black, very hard, heavy and fine-grained. Capable of very high polish. Used mostly for veneer.

2. Lignum Vitae. Blackish, with a greenish tint. Heavy, hard, strong and close-grained. Difficult to split. Used for ships, pulleys, balls for bowling alleys, mortars and pestles, etc. Found also in Central America and throughout South America.

3. Red Cedar. Wood rose red to brown-red. Light. Soft, brittle and fine-grained. Obnoxious to insects Used in cabinet-making, for trunks, and cigar boxes.

4. Granadillo or Rosewood. Red, handsomely figured, aromatic. Hard Used for building and furniture.

5. Cabbage Tree Wood. Brown, hard and durable. Used for mill rollers and in house and ship-building.

6. Avocado Pear. Grown chiefly for its fruit.

COLLECTION 213.

Foreign Woods: Mexico.

1. Mahogany. Hard, heavy, close and straight in grain. Durable and susceptible of a high polish. Does not shrink or warp. Used for making furniture and interior work in houses, ships and railroad cars.

2. Logwood. Deep, dull brownish red, very hard and heavy. Used for red or black dye.

3. Mora. Chestnut-brown or red, very heavy, hard and tough. Used for beams and planking in ship-building. Used as substitute for rosewood and mahogany.

4. Laurel. Heavy, hard, and susceptible of high polish. Used as substitute for oakwood.

5. Guava. Chiefly raised for its fruit, from the pulp of which a delicious jelly is made.

COLLECTION 214.

Foreign Woods: Central America, Nicaragua.

1. Bloodwood. Moderately heavy Easily dressed. Strong and durable. Used chiefly for posts and rails.

2. Rosewood. Red, handsomely figured. Hard and strong. Used for building and furniture.

3. Sapodilla or Bullet-wood. Very heavy, hard and durable. Used for furniture, cabinet work and building.

4. Ebony. See Collection 212.

COLLECTION 215.

Foreign Woods: Central America, Nicaragua.

1. Fustic. Yellow, light and durable. Used for spokes and for inlaid work. Its chief use is in dyeing textiles.

2. Balsam Fir. Very light, soft and coarse-grained. Not durable. Used for staves.

3. Mangrove wood. Very heavy, hard, tough and durable.

4. Madrona or Stracobérry-wood. Hard and heavy. Strong and close-grained. Used in making furniture and for charcoal for gunpowder.

COLLECTION 216.

Foreign Woods: Central America, Costa Rica.

1. Almond. Soft, open-grained. Used for spars for small vessels.

2. Myrtle. Close-grained, tough and durable. Used for tool handles and for flooring.

3. Kola. Native of Africa. Whitish. light, and porous. Much like poplar wood. Obnoxious to insects. Used in building boats and railroad cars.

4. Plum. Heavy and hard, but not very durable. Used by cabinet makers and turners.

COLLECTION 217.

Foreign Woods: Central America, Honduras.

1. Mahogany. See Collection 213.

2. Nispero or Bullet-wood. Reddish brown. Very heavy, hard and durable. Used for furniture and cabinet work.

3. Black-wood. Heavy, hard and tough. Takes fine polish. Used for sleepers, agricultural implements, tool-handles, carving and furniture.

4. Santa Maria. Moderately heavy and hard, flexible, durable and easily worked. Used for beams and planks in ship-building.

5. Honduras Cedar. Soft, light and easily split. Used in making cigar boxes and furniture.

6. Laurel. See Collection 213.

COLLECTION 218.

Foreign Woods: South America, Venezuela.

1. Cashew. Red to brown. Moderately hard. Used in boat building, for packing cases and for charcoal. Fruit of cashew tree, the cashew nut, is edible.

2. Cork-wood. Nut-brown. Very light. Used for floats for fishing nets.

3. Olive-wood. Light, yellowish brown, very close and fine-grained. Takes fine polish. Used chiefly in turnery and carving.

4. Roble. Oak family. Hard, tough wood, with a silvery grain. Used in ship-building.

COLLECTION 219.

Foreign Woods: South America, Brazil.

1 Brazil-wood. Hard, heavy and susceptible to polish. Employed in cabinet work, but chiefly as a red dye.

2. Peroba. Yellow, moderately heavy and very strong. Durable. Used in building Brazilian ironclads, and for furniture.

3. Palisander-wood. Dark brown, very hard and heavy. Almost brittle. Valuable wood, chiefly used in making pianos.

4. Palo d'Arco. Trumpet vine family. Very hard, compact and elastic. Used in cabinet work.

5. Guarabu. Pulse family. Fine-grained, hard and compact wood. Used in ship-building.

COLLECTION 220.

Foreign Woods: South America, Peru.

1. Peruvian Elder. Hard and firm wood. Used in turnery.

2. Cinchona or Peruvian Bark tree. Bark used in medicine.

COLLECTION 221.

Foreign Woods: South America, Argentine Republic.

1. Quebracho. Sumac family. Immense forests of this tree in Argentina. Used in building, especially of ships and railroad sleepers. Extensively used for tanning.

2. Algarrobo or Locust. Distributed throughout the republic. Wood light and easily worked. Used in building, carpentry and turning. Also prepared in blocks for paving streets. Of the pod of the tree bread is made.

3. Iron wood. Common throughout republic. Wood hard and dense. Used in making railway sleepers and in turning. Root used for tanning. Fruit edible.

4. Yellow wood. Wood of light green color. Used in making high-class furniture.

5. Guava. Myrtle family. Wood, rose color. Rather light. Used for cabinet work and turning. Fruit edible and employed in dyeing, while bark is used for tanning.

COLLECTION 222.

Foreign Woods: Asia.

1. Teak. Southeastern Asia. Wood very hard and durable. Fragrant. Obnoxious to insects. Best wood for ship-building. Also used in bridge-building, for sleepers and furniture.

2. Indian Satin wood. India and Ceylon. Beautiful light-colored, hard wood, used for inlaying and veneer.

3. Sappan wood. Southeastern Asia. Brownish red. Used almost exclusively as a red dye for cotton goods. The root yields an orange dye.

COLLECTION 223.

Foreign Woods: Asia, Philippine Islands.

1. Ebony. See Collection 212.

2. Red Sandalwood. Leguminosae. Deep red, heavy, very hard, fine grained taking a beautiful polish. Used for turnery, but chiefly as a red dye.

3. Sal or Guijo. Large tree of Diperto-carpaceae family. Light to deep brown, heavy, hard, coarse and cross-grained, very durable. Aromatic. Resin protects it from ants. Used for sleepers, beams, bridges, blocks and cogs.

4. Mango. Anacardiaceae. Dull gray, porous, hard, and close-grained. Stands exposure to salt water. Used for cart-wheels, canoes, and rough furniture.

5. Molave. Very high tree of Myrtaceae. Light brown, very heavy, hard, close-grained. Used for staves and furniture.

COLLECTION 224.

Foreign Woods: Asia, Japan.

1. Sugi or Japanese Cedar. Brownish red. Used for lacquer-ware.

2. Japanese Hemlock. Light, soft, and coarse-grained. Brittle and not durable. Used for sleepers, laths, rafters, planks, fencing, etc.

3. Japanese Ironwood or Kirnl Sapotaceae. Red, fine-grained and easily worked.

COLLECTION 225.

Foreign Woods: Australia.

1. Blue Gum or Gray Box. New South Wales. Red-brown. Very heavy and strong. Used for sleepers and in building.

2. Coachwood. New South Wales. Soft, light and exceedingly tough. Used for coach building and cabinet work.

3. Black-butt. Southeastern Australia. Yellowish brown, suitable for sleepers, paving, telegraph poles and in carpentry.

4. Stringy-bark. Southeastern Australia, Light-colored. Durable. Used for shingles and flooring.

5. Negrohead Beech. Tasmania and Victoria. Brownish, satinliké, hard and susceptible of fine polish. Used for cogs, doors, furniture and carpentry.

6. Sassafras. Southeastern Australia. Hard and solid, taking fine polish. Used for lasts, cabinet work and sounding boards.

7. Iron bark. Southeastern Australia. Brown, very hard, tough and strong. Much used for sleepers and other railroad work.

COLLECTION 226.

Foreign Woods: Australia.

1. Beef wood or Silky Oak. Queensland. Beautiful wood, hard and close-grained. Very durable. Used for furniture, veneer, and walking sticks.

2. Forest Oak. Queensland. Prettily marked. Used for furniture and veneer and for shingles.

3. Moreton Bay Pine. Queensland and New Guinea. Light colored, hard and strong. Used in cabinet work and carpentry.

4. Red Mahogany. Queensland. Light brown or dark red. Very strong and durable. Used for ships' knees, fence posts, rafters and shingles.

5. Tallow wood. Eastern Australia. Yellowish brown, resembling mahogany. Very durable. Used for flooring. One of the best woods for paving.

6. Turpentine tree. Queensland. Hard and durable. Used for sleepers and in building.

7. Corkwood. Eastern Australia. White or yellowish. Very soft. Bark resembles that of cork oak. Used for tool handles, cabinet work and sounding boards.

COLLECTION 227.

Foreign Woods: Australia.

1. Red or Pencil Cedar. Eastern Australia. Reddish wood of pretty figure. Fragrant. Substitute for mahogany. Used for furniture, turning, engraving, ship-building and pencils.

2. Red Bean. Eastern Australia. Soft and fine-grained. Resembles walnut. Takes good polish. Employed in making furniture and staves.

3. White Maple. Eastern Australia. White, close-grained and durable. Used for bed-room furniture.

4. Mountain Ash. Central and Eastern Australia. Hard, tough and durable, polishing well. Valuable for staves.

5. Spotted Gum. Eastern Australia. Heavy, strong and tough. In great demand for paving, bridge and ship-building, shingles, etc.

6. Teak. See Collection 222.

7. Black wood. Well distributed over Australia. Dark brown, hard and easily polished. One of the most valuable of Australian timbers. Used for oil casks, furniture, picture frames, and sounding boards of pianos.

BOTANICAL CHARTS.

Large Colored Charts Showing the Plants Given Below and Their Principal Parts.

COLLECTIONS.

228. Buttercup.
229. Mustard.
230. Pea.
231. Strawberry.
232. Plum.
233. Carrot.
234. Canada Thistle.
235. Primrose.
236. Potato.
237. Birch.
238. Willow.
239. Spruce.
240. Orchid.
241. Garlic.
242. Barley.
243. Fern.
244. Mushroom.
245. Buckwheat and Spinach (on one chart.)

BOTANICAL CHARTS.

Small Colored Charts. 8x10 inch Size.

COLLECTIONS.

246. Anemone or Windflower.
247. Pond Lily.
248. Poppy.
249. Violet.
250. Flax.
251. Storksbill.
252. Apple.
253. Pear.
254. Mossy Stone Crop.
255. Carrot.
256. Honeysuckle.
257. Cornflower.
258. Bellflower.
259. Heather.
260. Blueberry.
261. Primrose.
262. Comfrey.
263. Dodder.
264. Potato.
265. Toadflax.
266. Mullen.
267. Plaintain.
268. Dutchman's Pipe.
269. Spurge.
270. Hops.
271. Hazelnut.
272. Horsechestnut.
273. Willow.
274. Spotted Orchid.
275. Meadow Saffron.
276. Fleur-de-lis.
277. Fern.
278. Mushroom.

The Following Large Colored Charts Have Been Entered Under Respective Subjects. Collection Numbers Given Here Correspond With Previous Listing.

COLLECTIONS.

4. Wheat.
7. Rye.
10. Oats and Meadowgrass.
62. Pepper Plant.
201. India Rubber Plant.

COLLECTION 279.

Fruit Growing.

Mounted colored postals, illustrating fruits and fruit growing of the Torrid Zone.

To the Teacher:—

Use this blank page to insert additional collections from 280 to 300, to be given in future Supplementary Catalogues.

Page 27.

COLLECTION **167-a.**

LARGE COLORED CHART

The Pine Tree.

COLLECTION **198-a.**

Illustrations of Cork Industry.

Stereoscopic Views. Various phases of the cork industry.

MOUNTED DOMESTIC BIRDS.

REFERENCE BOOKS.

Blanchan—Birds Every Child Should Know.

Blanchan—Bird Neighbors.

Baily—Our Own Birds.

Chapman—Bird Life.

Forbush—Useful Birds and Their Protection.

Herrick—The Home Life of Wild Birds.

Schneider—Bird and Nature Study Manual.

Weed-Dearborn—Birds in Their Relation to Man.

Manual for the American Bird and Nature Study Chart, found in every School.

Birds, Loons and Grebes.

COLLECTIONS.

300. Loon. Range from Gulf to Arctic Circle. Excellent swimmer and quick diver. Feeds on fish and other aquatic animals.

301. Pied-billed Grebe. British America to Argentine Republic. Swims low in water and dives with great facility. Feeds on fish, mollusks, aquatic insects and some water plants.

Birds: Gulls and Cormorants.

COLLECTIONS.

302. Herring Gull. Male and female. Atlantic coast from Maine northward. Follows ships, feeding on scraps thrown overboard.

303. Double Crested Cormorant. Both hemispheres. Builds nest on rocky shores, rarely on trees. Feeds on fishes.

304. Bonaparte's Gull. British America. Winters south to Gulf of Mexico. Feeds on small fishes.

305. Franklin's Gull. Also called Hooded Gull. An abundant North American Species.

Birds: Terns.

Terns or sea-swallows are plentiful on our shores of both salt and fresh water. Breed on low-lying lands and make nests of sticks, moss and grasses. Feeds on small fish and aquatic insects.

COLLECTIONS.

306. Black Tern. Tropical and temperate America. Our common inland tern.

307. Wilson's Tern. Eastern part of North America.

Birds: Ducks.

Feed in shallow water upon mollusks, crustaceans, insects and their larvae, and seeds and roots of aquatic plants. Mostly northern breeders.

Birds: Pond and River Ducks.

COLLECTIONS.

308. Mallard Duck. Abundant from Central America to Canada on ponds covered with seed-bearing grasses. Ancestor of the domestic duck.

309. Blue-winged Teal. Eastern North America. In Western States only as transient visitors during spring and summer months. Flesh highly prized.

310. Shoveller or Spoonbill. Northern hemisphere. Common in Mississippi valley. Winter home in Southern States. Flesh edible.

311. Baldpate or Widgeon. Throughout North America. Winters in Central and Northern South America. Feeds on aquatic plants, insects and small mollusks.

312. Black Duck. Eastern North America. Winters south of West Indies. Looks very much like female of mallard duck. Feeds on mollusks, crustaceans and insects, and seeds, and roots of aquatic plants.

313. Pin Tail. Throughout North America. Winters from Central United States southward to the West Indies and Central America. Carnivorous.

314. Wood Duck. North America. Winters in Southern States, Mexico and Central America. Woodland ponds and streams.

315. Hooded Merganser. North America. Winters in Cuba and Mexico. Quiet streams, ponds or lakes. Hood disappears after breeding season.

316. Green-winged Teal. North America. Breeds from Minnesota northward. Winters from Kansas and Virginia southward to West Indies and Central America. Rapid flyer and quick diver. Piping note. In autumn, males are in separate flocks from females and young.

317. Old Squaw. Northern parts of both hemispheres. Adult male remarkable for its long tail.

Birds: Sea Ducks.

COLLECTIONS.

318. American Merganser. Northern part of North America. Winters in Southern States and Cuba. Excellent diver. Feeds on fishes.

319. Ring-necked Duck. North America. Winters in Southern States. Feeds on shellfish.

320. Ruddy Duck. Northern South America and United States.

321. Buffle Head. Abundant in North America.

322. Eider Duck. Male and female. Arctic regions. Highly valued for its down which the female plucks from her breast and with which she lines the nest and covers the eggs.

323. Blue Bill. Europe, Asia and North America. Found near mussel beds, feeding on mussels and other mollusks.

Birds: Geese.

COLLECTION **324.**

Goose.

Canada Goose. Temperate North America. Ancestor of Domestic Goose. Favorite Game Bird.

COLLECTION **325.**

Illustrations of Geese.

Large colored chart of the Goose.

WADING BIRDS.

Mostly belonging to Southern States Carnivorous, feeding upon crustaceans, mollusks, fish, worms, snails, etc.

Birds: Herons and Bitterns.

COLLECTIONS.

326. Little Blue Heron. Abundant in the cypress swamps of the Southern States.

327. Green Heron. Temperate and Tropical America. Food consists of fishes and reptiles.

328. Night Heron. Central and Southern States. Winters in South America. Nocturnal. Feeds on crawfish, frogs, etc.

329. American Bittern. Temperate regions of North America. Utters a loud, booming cry which can be heard at great distance. Habits and food much like the heron's. Very pugnacious.

Birds: Ibis and Spoonbill.

COLLECTIONS.

330. Wood Ibis. Male and female. From Brazil to the Southern States. Found along banks of rivers, in swamps and meadows. Feeds on worms, insects, and crustaceans.

331. Roseate Spoonbill. Tropical and Subtropical America. Sea coast and mouth of rivers, where it feeds on fish, crustaceans, and other marine animals, immersing and swinging its spoonlike bill in quest of them.

Birds: Rails, Coots, Etc.

COLLECTIONS.

332. Sora Rail. Central United States. Winters in Southern States and Central America. Frequents rice marshes. Protective coloration. Feeds on small snails, shells, and worms.

333. Florida Gallinule. Tropical and Subtropical America. Common in Southern States. Flies with difficulty.

334. American Avocet. Temperate regions of North America. Winters along the coast of Gulf of Mexico. Sea coasts and marshy lands. Long curved bill. Feeds on worms, insects, and small crustaceans.

335. American Coot or Mud-Hen. Temperate regions of North America, especially in marshes of Mississippi Valley. Nest very large, made of reed and water herbage. Feeds on mollusks and insects.

Birds: Snipes, Plovers, Etc.

COLLECTIONS.

336. Wilson's Snipe. North America. Winters in Southern States. Frequents fresh water marshes and meadows, using bill as mud borer. Largely nocturnal. Swift flyer. Flesh excellent.

337. Long-billed Curlew. United States. Winters in Southern States. Feeds on beetles, worms, grasshoppers, crabs and snails, probing into the mud with its long bill.

338. Killdeer Plover. South America to Canada. Frequents pastures and cultivated fields, picking up grubs and worms from fresh soil. Swift flyer.

Birds: Sandpipers, Etc.

COLLECTIONS.

339. Marbled Godwit. Temperate

North America. Marshy regions. Probes the soil with bill for food, consisting of mollusks and insects. Flesh very palatable.

340. Spotted Sandpiper. North America as far north as Hudson Bay. Winters south to Brazil. On shores and banks of streams and ponds.

341. Yellowlegs. North America as far as Arctic regions. Wet and marshy lands. Feeds on worms and insects. Quick, active, and noisy.

342. Pectoral Sandpiper, or Grass Snipe. A characteristic American Species, comparatively large sized.

343. Black-necked Stilt. A rare bird in the Eastern United States, but abundant in some parts of the West.

TERRESTRIAL BIRDS.

Protectively colored. Feet adapted for scratching. Feed on insects, worms, and seeds. Do not migrate. Excellent game birds.

COLLECTIONS.

344. Bob White. Eastern and Central North America. Resident. Very useful to farmer, destroying large numbers of injurious insects and weed seeds.

345. Mountain Partridge. Northern Pacific Coast. Showing plumage in summer, fall and winter.

346. California Quail. Male and female. Northern Pacific Coast. Higher mountain ranges. Rapid runner.

COLLECTION **347.**

Birds: Ostrich.

Young Ostrich. California. Largest of birds. Swift runner. Gregarious. Adult from 6 to 8 feet high. Feathers highly valued.

Birds: Grouse, Etc.

COLLECTIONS.

348. Ruffed Grouse. Eastern United States. Gregarious. Produces loud, thumping noise by striking wings. Feeds on insects, seeds, berries, and buds.

350. Prairie Hen. Central plains of North America. Much hunted for its excellent flesh.

Birds: Domestic Fowl.

COLLECTIONS.

351. Domestic Fowl, male. Found in every country.

352. Domestic Fowl, female. Found in every country.

Birds: Pheasants.

COLLECTIONS.

353. Golden Pheasant. Native of China. Bred in various parts of the United States, especially Oregon. Feeds on insects, seeds, and grain. Flesh highly valued.

354. Ring-necked Pheasant. Native of Eastern Asia. Introduced in the United States. Great destroyer of insects. Food and habits like those of Golden Pheasant.

Birds: Doves, Pigeons.

COLLECTIONS.

355. Mourning or Turtle Dove. Temperate regions of North America, east of Rocky Mountains. Feeds on seeds and grain, and frequents places where domestic birds are fed.

356. Passenger Pigeon. The Common wild pigeon of the United States (now almost extinct), called Passenger Pigeon because of its very extensive wanderings in search of food.

Birds: Hawks.

Carnivorous. Grasp prey, small mammals and birds, with talons, tearing them to pieces with bill. Swift flyers. Return to same locality from year to year.

COLLECTIONS.

357. Red-shouldered Hawk. Eastern North America. In woods and near streams. Very useful to farmer. Feeds on frogs, worms, snakes and field mice, rarely on birds.

358. Sparrow Hawk. North America from Gulf to Hudson Bay. Beneficial to farmer, destroying grasshoppers and field mice. Smallest of hawks.

360. Red-tailed Hawk. Eastern North America. Great destroyer of noxious animals. Commonly but falsely called Chicken hawk. Rarely kills a chicken, is one of the farmer's best friends.

361. Ferruginous Roughleg. Western United States. Handsomest of American hawks. Feeds on small gnawing animals and grasshoppers; never attacks birds.

362. Marsh Hawk. In all parts of America.

363. Cooper's Hawk. The Chief robber of our chicken yard.

364. Sharp-shinned Hawk. North America. Very voracious and injurious, its principal food being song birds.

365. Swainson's Hawk. A prairie Bird, which is one of the farmer's best friends.

366. American Goshawk. Woodland bird. Feeds on smaller birds. Very destructive to poultry and pigeons.

COLLECTION.

Birds: Eagles.

367. Golden Eagle. All parts of North America. By preference a bird of the mountains. Very destructive to smaller animals.

Birds: Owls.

Carnivorous. Nocturnal. Pass the day in hollow trees or deserted buildings. Feed on small mammals, as mice, etc. Very useful to farmers.

COLLECTIONS.

368. Barn Owl. North America. Permanently resident. Hidden during the day in hollow tree, barn or stable.

369. Short-eared Owl. Found everywhere in America. Lives in grassy marshes, passing the day on the ground. Destroys large quantities of field mice.

370. Screech Owl. Eastern North America. Smallest and best-known of American owls. Found about human dwellings, feeding on smaller mammals and insects.

371. Barrel Owl. North America generally. Found in forests only.

372. Long-eared Owl. Eastern North America. Conspicuous ear tufts. Lives in forests, feeding upon birds and rabbits.

373. Great Horned Owl. Variety of long-eared owl. Largest of all owls. Found only in the wilder and more heavily wooded parts of our country.

374. Snowy Owl. Canada. Winters in Northern United States. Woods near water. Diurnal. Feeds on mice and birds.

375. Hawk Owl. North of the United States. Hunts prey by day. Resembles hawk in general form of body.

376. Burrowing Owl. Prairies of Western North America. Nests in burrows made by mammals, especially prairie-dogs. Feeds on small rodents, reptiles, and insects.

Birds: Woodpeckers.

Migratory. Non-musical. Arrangement of toes adapted to climbing and creeping. Feed on insects and their larvae, and tree-juices.

COLLECTIONS.

377. Red-headed Woodpecker. Eastern North America. Does not migrate if food is abundant. Stores acorns and beech nuts in hollow trees.

378. Downy Woodpecker. Abundant in Eastern United States. Feeds on insects and the inner milky bark of trees.

379. Hairy Woodpecker. Eastern United States from Canada to South Carolina. Resident of deep woods. Very useful, ridding trees of injurious insects.

380. Red-bellied Woodpecker. Eastern United States. Winters from Virginia and Ohio southward. Builds nest in chiseled-out hole in tree trunk.

381. Sapsucker. Eastern North America. Winters in Southern States and Central America. Injurious to trees, puncturing them to feed upon the sap.

382. Flicker. North America east of Rocky Mountains. Mostly on ground, feeding on ants. Very useful to farmer.

383. Pileated Woodpecker. North America. Rare in populous districts. One of the largest of woodpeckers. Frequents pine forests.

384. Ivory-billed Woodpecker. Southern States. Pine forests. Very useful in destroying injurious insects.

Birds: Kingfishers and Cuckoos.

COLLECTIONS.

385. Belted Kingfisher. North America. Migratory. Winters from Virginia southward to South America. Wooded lakes and streams. Perches on branch of tree overhanging the water, watching for fish. Feeds also on fresh water mollusks and insects.

386. Yellow-billed Cuckoo. Temperate regions of North America. Winters in Central and South America. In tall shrubbery or low trees near running water. Very useful. Feeds on insects, caterpillars being its favorite food.

387. Road-Runner. Texas and Southern California. On ground. Seldom uses wings. Feeds upon mice, lizards, small snakes and insects.

Birds: Humming Birds, Chimney Swifts, Etc.

COLLECTIONS.

388. Humming Bird. North America east of Mississippi. Winters in South ern States and Central America. Feeds on insects and juices of flowers. Feeds young by regurgitation.

389. Chimney Swift. Eastern North America. Winters in Central America. Roosts in hollow trees, caves, and chimneys. Nocturnal. Feeds on insects.

390. Night Hawk. North America, from Mexico to Arctic region. In trees and on ground. Not nocturnal, as its name would indicate. Feeds on insects. Gregarious.

391. Whippoorwill. Eastern North America. Rocky, solitary woods. Nocturnal. Peculiar sort of fly-trap mouth well adapted to catching insects. Very useful.

Birds: Flycatchers, Kingbirds, etc.

Songless perchers. Most abundant in the tropics. Frequent trees, hedges and fences. Live on insects, including moths and butterflies. Very useful.

COLLECTIONS.

392. King-bird. North America to Southern Canada. Winters in Central and South America. Found on tree branches watching for prey. Feeds upon injurious insects, rarely upon bees. Courageous. Attacks crows and hawks.

393. Phoebe. Eastern North America. Winters in Southern States and Cuba. Builds nest on beam or rafter of shed, or under bridges.

394. Crested Flycatcher. A bird addicted to the habit of catching insects on the wing. Has a flattened bill, furnished with rictal bristles.

395. Arkansas King Bird. Western United States. Food and habits like those of King-bird.

396. Wood Pewee. Eastern North America. Winters in Central America. In tall, shady trees. See Trowbridge's poem.

Birds: Crows and Jays.

Inhabit wooded regions. Songless perchers. Feed on fruits, seeds, insects, eggs and young birds in their nests.

COLLECTIONS.

397. Crow. North America. Winters in United States. Roosts in colonies. Very intelligent. Follows the plow, eating larvae and worms, but feeds on eggs and young nestlings also.

398. Blue Jay. Eastern North America. Not migratory. Noisy and voracious. Robs nests and destroys young birds. Buries nuts and hard seeds in the ground.

399. Raven. Northern regions of North America. In forests and on cliffs. Cunning and mischievous. Feeds on grubs, worms, grain, and field mice. May be taught to speak.

400. Prairie Horned Lark. Northern parts of North America, east of the Mississippi. Resident. Sings in mid-air on the wing.

Birds: Blackbirds and Orioles.

Migratory. Feed on fruits, seeds, and insects.

COLLECTIONS.

401. Red-winged Blackbird. Eastern North America. Winters in Southern States. Found in low bushes or reeds in marshes. Feeds on wild rice, seeds and insects.

402. Yellow-headed Blackbird. Western North America. Generally found in marshes, sometimes in company with cowbirds following cattle. No singer.

403. Bronzed Grackle. United States Winters in lower Mississippi Valley. Feeds upon seeds, particularly corn, eggs, and young birds.

404. Great-tailed Grackle. British Columbia. Winters in Southern States. Found in prairies and bushy swamps.

405. Purple Grackle. Gulf of Mexico to Labrador. Gregarious. Prefers dense pine forests. Feeds on grain, grasshoppers, young birds and eggs.

406. Meadowlark. Eastern North America. Winters in Southern States. Terrestrial Protectively colored. Migrates in flocks. Song bird.

407. Baltimore Oriole. Eastern North America. Winters in Mexico and Central America. Feeds upon caterpillars and injurious insects. Highly prized for its beauty and song.

408. Orchard Oriole. Common in temperate regions of the United States. Winters in Central America. In our orchards and about our homes. Much valued because of song, beauty, and insectivorous habits.

409. Bobolink. Northern United States and Canada. Winters in eastern portion of Southern States and South America. Frequents open fields. Very injurious to rice fields.

410. Cowbird. From Mexico to British America. Winters in Central and Southern States. Walks about among cattle, picking up small insects disturbed by cows in grazing.

Birds: Sparrows.

Found in fields, pastures, groves, and shrubberies. Coloring adapted to surroundings. Bills conical, short and stout for cracking seeds.

COLLECTIONS.

411. Chipping Sparrow. Eastern North America. Winters in Southern States. Lives about our houses until fall, when it removes to weedy fields.

412. English or House Sparrow. Introduced from Europe in 1851. Builds about houses, but visits grain fields, orchards, woods and marshes. Omnivorous and highly injurious.

413. Song Sparrow. Eastern North America. Winters in Southern States. On the ground or in bushes near the water. Valued for its sweet and sprightly song.

414. Vesper Sparrow. North America. Winters south of Virginia. Open pasture lands. Mostly on ground. Fine singer.

415. White-throated Sparrow. From Central Eastern North America to Labrador. Winters south to Florida. Most handsome of sparrows. Good singer.

416. Tree Sparrow. North America west to plains. Winters in United States. Not in trees as name would indicate, but about shrubbery and on ground. Song soft and sweet.

417. Le Conte's Sparrow. Northern States. Winters in Middle and Southern States. Abundant in Mississippi Valley.

418. Field Sparrow. Male and female. Eastern North America, from Canada to Gulf. Scrubby pastures. Good singer.

Birds: Finches, Grosbeaks, Towhees, etc.

Fine songsters. Bills conical and heavy, well adapted for crushing of seeds. Remain with us from early spring till late fall.

COLLECTIONS.

419. Rose-breasted Grosbeak. Eastern North America. Winters in Central and South America. In tree or bush. Female of plain brown color. Destroys great numbers of potato bugs, but also feeds on peas.

420. Evening Grosbeak. British America. Winters in interior of United States. Feeds on seeds and on buds of various trees.

421. Blue Grosbeak. United States westward to Rocky Mountains and Mexico. Frequents roadside thickets and tall weeds. Feeds on seeds and kernels; fond of rice. Good singer.

422. Indigo Bunting. Eastern United States. Winters in Central America. Female of dull brown color. Builds nest in bush near ground. Feeds on seeds, occasionally on insects.

423. Goldfinch. Eastern North America. Winters in United States, changing plumage to brown color. Feeds on seeds of wild flowers, particularly of thistle.

424. Purple Finch. North America. Most common in Middle and Eastern States. Gardens and orchards. Rather destructive to trees, being fond of fruit blossoms and tree buds. Fine singer.

425. Cardinal. Eastern United States. Resident. Female olive brown. Builds in bushes near grain or corn fields.

426. Slate-colored Junco. North America. Winters in Middle and Gulf States. Quite common in Mississippi Valley in winter in the company of sparrows.

427. Dickcissel. Eastern and Middle United States. Winters in Central and South America. Common in Mississippi Valley.

428. Towhee. North America south of Labador and east of Rocky Mountains. Found in swamps and bushy fields. Feeds on earthworms, larvae of insects, and berries.

429. Lapland Longspur. Northern United States to Arctic regions. Winters as far south as Kansas and Rocky Mountains. Has long hind claw or spur. Ground bird.

430. Red Crossbill. Northern States. Winters in pine forests of Southern States. Crossed bill fitted for extracting seeds from cones and fruits. Holds cone in its feet like parrot.

Birds: Tanager, Martin, Waxwing.

COLLECTIONS.

431. Scarlet Tanager. Eastern North America. Winters in Central and South America. Female olive green. Inhabits forests. Feeds on seeds, fruits and insects.

432. Purple Martin. North America, wintering in Central and South America. When not flying perches on telegraph wires and eaves of barns. Feeds on insects.

433. Cedar Waxwing. North America. Winters in United States. Wings furnished with red tips resembling sealing wax. Feeds on insects and wild berries.

Birds: Swallows and Shrikes.

COLLECTIONS.

434. Shrike. Eastern North America. Resident. Bird of prey. Feeds on mice, small birds, snakes, and grasshoppers.

435. Barn Swallow. North America. Winters in tropical America. Insectivorous. Very useful.

436. Cliff Swallow. North and South America, wintering in the tropics. Nest attached to a projecting cliff or cave in the west and the eaves of barns in the east. Live in colonies.

437. Bank Swallow. Throughout North America, south of Hudson Bay. Frequents brooks cutting through sand near the sea. Nests in round hole bored into the sand.

Birds: Vireos.

Live in trees. Fine singers. Feed on insects, which they gather from branches, leaves, and fruit.

COLLECTIONS.

438. Yellow-throated Vireo. North America west to Rocky Mountains. Winters in tropical America.

439. Red-eyed Vireo. United States west to Rocky Mountains. Winters in Tropical America.

Birds: Warblers.

Distinctly American. Live in treetops. Migratory and gregarious. Frequently victims of lighthouses and electric lights. Feed on insects.

COLLECTIONS.

440. Parula Warbler. Eastern North America, wintering in the Southern States and Central America. In orchards and gardens.

441. Magnolia Warbler. Eastern North America. Winters in Central America and Cuba. Southern home in magnolia, northern in spruces and hemlocks.

442. Yellow Warbler. North America except Southwestern States. Winters in Central America. Found in gardens, orchands, and brookside. Builds nest in low willow tree near streams.

443. Nashville Warbler. North America, wintering in Central America and Mexico. In open woods, particularly in hemlock and pine trees.

444. Kentucky Warbler. United States east of Rocky Mountains. Winters in Central America. Terrestrial In low, damp places in the woods.

445. Black-Poll Warbler. North America to Arctic regions. Winters south to South America. Often found in May in apple trees looking for insects in blossoms.

446. Black and White Warbler. Eastern United States and Canada. Winters in Tropical America. Runs up and down the trees, like Downy Woodpecker to look for insects.

447. Prothonotary Warbler. Eastern United States. Quite abundant in Mississippi Valley.

448. Tennessee Warbler. Southern States. Habits like those of Nashville Warbler.

449. Cerulean Warbler. Eastern North America. Winters in Tropical America Abundant in Mississippi Valley. Mostly in tops of trees.

450. Chestnut-sided Warbler. Eastern North America to Hudson Bay. Winters in Tropics. In gardens and orchards. Very fond of ants.

451. Blackburnian Warbler. Eastern North America. Winters in Tropical America. Most beautiful of warblers.

452. Bay-breasted Warbler. Eastern North America and Canada. Nests north of United States.

453. Prairie Warbler. Eastern United States. Winters in Central America and the West Indies. Prefers open country to the woods.

454. Pine Warbler. North America east of Rocky Mountains to Manitoba. Winters in Southern States and the Bahamas. Only in pine woods.

455. Palm Warbler. Common in Mississippi Valley. Winters in Florida. Prefers fields and roadsides to woods.

456. Canadian Warbler. United States and Canada. In low woods.

457. Maryland Yellow Throat. Eastern North America and Canada. Winters in Central America. Marshy ground and scrubby pastures. Fine singer.

453. Western Yellow Throat. A western species somewhat larger than the Maryland Yellow Throat.

458a. Yellow-breasted Chat. Scolds those who intrude upon its haunts. Noted for the volubility and mimicry of its song.

459. Ovenbird. United States and Canada. Winters in Southern States. Common summer resident. Mostly on ground in woods. Song resembles the word "teacher."

460. Redstart. United States and Canada. Very useful, destroying great quantities of caterpillars. Opens and shuts tail like fan.

Birds: Thrasher, Mockingbird, Catbird.

COLLECTIONS.

461. Brown Thrasher. Eastern North America, wintering in the Southern States. Mostly on ground, feeding upon worms and insects. Fine songster.

462. St. Lucas Thrasher. Pacific States. Common in Lower California. Fine singer.

463. Mockingbird. United States. Resident. Excellent singer. Imitates song of other birds. Nests in thickets near the ground. Feeds on insects and berries.

464. Catbird. United States and Canada. Winters in Southern States, Central America and West Indies. Sings beautifully, but also utters cat-like cry, which has given it its name. Common summer resident.

Birds: Wrens and Creepers.

COLLECTIONS.

465. Long-billed Marsh Wren. United States and Southern Canada. Winters in Southern States and Mexico. Common in marshes, near brooks, and rivers. Very shy and retired.

466. House Wren. One of our songsters. Will return to the same nesting place year after year.

467. Winter Wren. Appears when the House Wren departs for the South. Also a very melodious singer.

468. Brown Creeper. Eastern United States and Canada. Winter resident in United States. Very useful. Climbs up trunk of tree in a sort of spiral in search of insects.

Birds. Pipits and Ousels.

COLLECTIONS.

469. American Pipit. North America. Winters from Virginia south. Frequents salt marshes and open stretches of country. Likes to walk or run over the ground. Sings as it flies.

470. Water Ousel. Western North America. Rapid streams in hilly country. Found on stones in water bobbing up and down, looking for insects and small mollusks.

Birds: Tit mice, Chickadees and Kinglets.

COLLECTIONS.

471. Tufted Titmouse. Eastern United States. Resident. Expert climber. In tops of pine trees. Feeds on insects and their larvae and beech nuts.

472. Black-crested Titmouse. Texas and Mexico. Food and habits like those of Tufted Titmouse.

473. Chickadee. Eastern North America. Resident. Well-timbered districts. Builds nest in hole or stump of tree. Very useful, destroying large quantities of injurious insects.

474. Chestnut-backed Chickadee. Southern United States. Very useful, destroying insects.

475. Golden-crowned Kinglet. North America. Winters from North Carolina to Central America. Gregarious. Generally flitting about the ends of twigs peering at the bark for hidden insects. Fine songster.

Birds: Nuthatches and Gnatcatchers.

COLLECTIONS.

476. White-breasted Nuthatch. Eastern United States to Canada. Resident. Habits much like those of Brown Creeper. Runs up and down trees in search of spiders, eggs, larvae, etc. Very useful.

477. Brown-headed Nuthatch. Southern States. Common in pine forests. Food and habits like those of White-breasted Nuthatch.

478. Gnatcatcher. United States and Canada. Winters in Mexico. In thick woodlands. Feeds on flies, gnats, and mosquitoes.

Birds: Thrushes.

Our finest songsters. Inhabit woodlands. Migratory. Great destroyers of insects. Feed mostly on the ground.

COLLECTIONS.

479. Wood Thrush. Eastern United States. Winters in Central America. In maples and elms about human dwellings. Nest built in sapling near ground.

480. Hermit Thrush. Eastern North America. Winters in Middle and Southern States. Smallest of Thrushes. In dense woods. One of the finest singers.

481. Varied Thrush. Western parts of North America. Food and habits much like those of robin.

482. Robin. Eastern North America to Rocky Mountains. Winters chiefly in Southern States. Best known of thrushes. Feeds on worms and fruits, particularly cherries.

483. Bluebird. United States. Winters in Southern States. Builds about our homes. Decreasing because of persecution by English sparrow.

ILLUSTRATIONS OF BIRDS.

COLLECTIONS.

484. Stereoscopic views illustrative of Bird Life.

485. Photographs illustrative of Ostrich Life.

486. Stereoscopic views illustrative of Ostrich Life.

487. Colored Post Cards illustrative of Bird Life.

ILLUSTRATIONS OF BIRDS.

Large Colored Charts Illustrating the Life of Some of the Large Birds.

COLLECTIONS.

488. Ostrich.
489. Pelican.
490. Swan.
491. Turkey.
492. Stork.
492a. Eagle's Nest.
493. Owl.
494. Ringnecked Pheasant.
495. Crow.
496. Woodpecker.
497. Rooster.
498. Rooster, Hen and Chicks.

Small colored charts, illustrative of Bird Life.

COLLECTION **499.**

Illustrations of Birds: Ducks.

1 and 2. Mallard Duck, male and female.
3. Baldpate.
4. Green-winged Teal.
5. Blue-winged Teal.
6 and 7. Wood Duck, Male and Female.
8. Canvasback.

COLLECTION **500.**

Illustrations of Birds: Wading Birds.

1. Great Blue Heron.
2. King Rail.
3. Sora Rail.
4. Greater Yellow-legs.
5. Dowitcher.

COLLECTION **501.**

Illustrations of Birds: Wading Birds.

1. Wilson's Snipe.
2. Golden Plover.
3. Upland Plover.
4. Black-bellied Plover.

COLLECTION 502.

Illustrations of Birds: Terrestrial Birds.

1 and 2. Ring-necked Pheasant, Male and Female.
3. Ruffed Grouse.
4. Spruce Grouse.
5. Wood Cock.
6. Quail.

COLLECTION 503.

Illustrations of Birds: Woodpeckers.

1. { Pileated Woodpecker. / Downy Woodpecker.

COLLECTION 504.

Illustrations of Birds: Night Hawks.

1. { Night Hawk. / Whippoorwill.

COLLECTION 505.

Illustrations of Birds: Hawks and Owls.

1. { Red-tailed Hawk. / Cooper's Hawk.
2. Screech Owl.

COLLECTION 506.

Illustrations of Birds: Cuckoos and Kingfishers.

1. { Black-billed Cuckoo. / Fantailed Cuckoo.
2. Belted Kingfisher.

COLLECTION 507.

Illustrations of Birds: Flycatchers, etc.

1. { King Bird. / Phoebe.
2. { Tree Sparrow. / Snowflake.

COLLECTION 508.

Illustrations of Birds: Nuthatches, Thrushes, etc.

1. { Nuthatch. / Chickadee.
2. { Brown Creeper. / Golden-crowned Knight. / Ruby-throated Knight.
3. { Wood Thrush. / Hermit Thrush.
4. { Cedar Waxwing. / Red-eyed Vireo.

MOUNTED FOREIGN BIRDS.

REFERENCE BOOKS.

Hornaday—American Natural History.
Newton—Dictionary of Birds.
Wood—Popular Natural History.

Foreign Birds: Ducks.

COLLECTIONS.

509. Mandarin Duck (Aix galericulata) China. Handsome plumage of male lost during four months of year when the bird assumes a plain-tinted dress resembling that of its mate.

Previously listed as 322.

Eider Duck (Somateria mollissima). Boreal regions. Low, rocky islands near the coast. Highly valued for its down, which the female plucks from her breast and with which she lines the nest and covers the eggs.

Foreign Birds: Wading Birds.

COLLECTIONS.

510. Chestnut-flanked Rail (Amaurornis phoenacura.) Eastern Asia. In swamps and marshes.

511. Stint or Sandpiper (Tringa pacifica). Eastern Asia. Protective coloration.

512. Lapwing (Vanellus cristatus). Temperate regions of Old World. Very useful to farmer, destroying grubs, worms, slugs and insects. Excellent flesh.

513. Wattled Lapwing. (Lobivanellus cinencis.) Eastern Asia. Food and habits like those of common lapwing.

Foreign Birds: Terrestrial Birds.

COLLECTIONS.

514. Willow Ptarmigan (Lagopus albus). Whole continent of Europe and Asia. Protective coloration. Higher levels and lower mountain slopes interspersed with willows and birches.

515. European Partridge (Perdix cinerea). Prefers open ground and often nests in exposed places. It feeds on slugs, caterpillars and grubs.

516. Black Grouse (Tetrao tetrix). Wide range on European Continent. Heaths and pinewoods. Not migratory. Feeds on insects, worms and seeds.

517. Blood Pheasant (Itaginis sinensis). Himalayas at height of from 10,000 to 14,000 feet. Burrows under the snow for protection in winter. Feeds on tops of juniper and pine, berries and moss.

Foreign Birds: Owls.

COLLECTIONS.

518. Dwarf Owl (Scops gin). Southern Europe. Winters south of Mediterranean. Smallest of European owls.

519. Woodcock Owl (Otus brachyotus.) Europe, Asia, North Africa, and America. Frequents heaths and moors.

520. Tengualm Owl (Strix tengualmi). Europe and America. In pine forests.

521. Little Owl (Strix noctua.) Greater part of Europe. Very voracious, eating the same food as its large relatives. Easily tamed.

522. Eagle Owl (Bubo maximus.) Northern parts of Europe. Largest of owls. Feeds on larger birds and rodents.

523. Ural Owl (Strix uralensis.) Colder regions of Europe and Asia. Food and habits much like those of Eagle Owl.

Foreign Birds: Woodpeckers.

COLLECTIONS.

524. Gray Woodpecker (Picus canus.) Europe and Eastern Asia. Spends much of its time on ground spearing ants with its wormlike barbed tongue.

525. Green Woodpecker. (Gecenus viridis.) Europe, India, and China. Three-toed. Habits like those of Gray Woodpecker.

526. Orange Woodpecker. Brachypternus aurantius. Java.

Foreign Birds: Kingfishers.

COLLECTIONS.

527. European Kingfisher. (Alcedo ispida.) Middle Europe. Near streams. Feeds on small fish, crabs, and insects. Digs hole in bank of streams for its nest.

528. Asiatic Kingfisher. (Ceryle varius), male and female. China. Feeds on fish, lizards, and insects.

529. Crested Kingfisher. Central America. Larger than European and Asiatic Kingfishers.

Foreign Birds: Rollers and Motmots.

COLLECTIONS.

530. Common Roller (Coracias garrula). Central Europe. Has its name from its peculiar flight. Often turns over in the air while flying. Nocturnal. Feeds on insects.

531. Broadbilled Roller. (Eurysthomus orientalis.) Australia and Austro-Malayan regions. Food and habits like those of Common Roller.

532. Mexican Motmot. Dense forests of Mexico. Perched on trees during the day. In the morning and evening in pursuit of prey, which consists of insects, lizards, and small birds.

Foreign Birds: Trogons.

COLLECTIONS.

533. Resplendent Trogon, or Quesal, (Pharomacrus mocinno.) Tropical America. One of the most beautiful birds. Dense forests. Feeds on fruits, berries, and insects.

534. Green Trogon. (Trogon viridis). Central and South America. Feeds on fruit and insects. Breeds in abandoned woodpecker holes.

535. Mexican Trogon. (Trogon mexicanus.) Food and habits like those of Green Trogon.

536. Coppery-tailed Trogon, a species of Trogon extending over the Mexican border up into Arizona.

Foreign Birds: Barbets or Puffbirds.

COLLECTIONS.

537. Crimson-Crested Barbet. (Megalaema virens.) India and Ceylon. Puffs out its plumage forming ball of feathers. Solitary and melancholy bird. Feeds on insects.

538. Green Barbet. (Chotorrhea versi-color.) Asiatic Islands. Food and habits like those of Crimson-crested Barbet.

COLLECTION **539.**

Foreign Birds: Hoopoe.

Common Hoopoe. (Upupa epops.) Widely distributed over Europe, Asia and Africa. Marshy places in neighborhood of woods. Feeds on insects on ground. Peculiar habit of constantly nodding head.

Foreign Birds: Parrots.

COLLECTIONS.

540. Gray Parrot. Native of Western Africa. One of the most common of parrots. Very docile. Easily learns to speak and whistle.

541. Green Parrot, (Chrysotis jestivus.) Native of South America. Frequents banks of Amazon. Not as apt to learn to talk as the Gray Parrot.

542. Whiteheaded Parrot. (Psittacus leucocephalus.) South America. Easily tamed. Talkative and great imitator of voices of animals.

543. Yellow-headed Parrot. South America. Very beautiful, but unable to learn to talk; only utters harsh scream.

Foreign Birds: Parrakeets and Cockatoos.

COLLECTIONS.

544. Warbling Grass Parrakeet. (Melopsittacus undulatus.) Australia. In large flocks. Feeds on seeds of grasses. Instead of screech utters soft warbling notes.

545. Rose-ringed Parrakeet. (Palaeornis torquatus.) Eastern Asia. Very beautiful, but rarely learns to speak.

546. Sulphur-crested Cockatoo, (Cacatua galerita.) Australia. In large flocks. Very injurious because of its devastation among crops. Easily tamed.

Foreign Birds: Toucans.

COLLECTIONS.

547. Yellow-throated Toucan. (Rhampastos tucanus.) Central and South America. Lives in considerable flocks in forests. Omnivorous, feeding mostly on fruit. Builds nest in hollows of trees.

548. Ariel Toucan. Brazil. Food and habits like those of Yellow-throated Toucan.

Foreign Birds: Bee-eaters and Fly-catchers.

COLLECTIONS.

549. Bee-eater. (Merops apiaster.) Feeds on bees, wasps, and similar insects. Exceedingly injurious. Flesh palatable.

550. Paradise Fly-catcher. (Terpsiphone princeps.) Eastern Asia, principally Japan. Plumage of male becomes generally white during part of year.

Foreign Birds: Crows and Jays.

COLLECTIONS.

551. European Jay. (Garrulus glandarius.) Common throughout Europe. Inhabits dense forests. Feeds on fruits and insects. Mimics voices of other animals.

552. Red-billed Magpie. (Urocissa erythorryncha.) Himalaya Mts. Feeds on fruits and insects, and sometimes smaller birds.

553. Asiatic Jay. (Dendrocissa sinensis.) Eastern Asia. Food and habits like those of European Jay.

COLLECTION 554.

Foreign Birds: Drongos.

Drongo. (Chibia hottentotta.) Male and female. Africa and Eastern Asia. Frequents gardens and forests, usually in pairs. Feeds on insects of all kinds. Active and pugnacious.

Foreign Birds: Starlings.

COLLECTIONS.

555. Crested Starling or Myna. (Acridotheres cristatellus.) China and India.

556. Red billed Starling. (Spodiopsar cineraceus.) Eastern Asia.

Foreign Birds: Orioles and Grackles.

COLLECTIONS.

557. Golden Oriole. (Oriolus Kindoo.) India. Outskirts of forests. Very timid. Utters loud, plaintive cry. Feeds on fruit and insects.

558. Minor Grackle. (Gracula minor.) Asiatic Islands. Special favorite in China. Feeds on insects and fruits. Very fond of cherries and grapes.

Foreign Birds: Sparrows and Buntings.

COLLECTIONS.

559. Red Sparrow. (Sparrow rutilans.) Eastern Asia. Food and habits like those of American sparrows.

560. Asiatic Yellow Hammer. (Emberiza Aureola.) Male and female. Pleasing singer. Feeds on grains, seeds, and insects.

561. Gold Bunting. (Emberiza elegans.) Eastern Asia. Food and habits like those of Yellow Hammer.

Foreign Birds: Finches and Warblers.

COLLECTIONS.

562. Rose Finch. (Carpodacus erythrinus.) Eastern Asia. Good singer. Feeds on buds, berries, and insects.

563. Green Finch. (Chloris sinica.) Europe and Eastern Asia.

564. Bush Warbler. (Cettia sinensis.) China and India.

Foreign Birds: Tanagers and Shrikes.

COLLECTIONS.

565. Black Tanager. (Tachyphonus Melaneus.) Male and female. Costa Rica. Inhabits forests. Feeds on seeds, grains, and fruit

566. Spotted Shrike. (Lanius tigris.) Eastern Asia. Bird of prey. Feeds on mice, small birds, and snakes.

COLLECTION **567.**

Foreign Birds: Wrens.

Willow Wren. (Phyllosocopis Fringulus.) Eastern Asia.. Restless and graceful. Good singer.

Foreign Birds: Titmice.

COLLECTIONS.

568. Coal Titmouse. (Parus ater.) Throughout Europe. Roves from tree to tree in search of insects and seeds.

569. Little Titmouse. (Parus minor.) China. Food and habits like those of American Titmice.

570. Bottle Titmouse. (Accredula concinna.) Europe and Northern Asia. These birds have notes, on the sound of which they assemble.

571. Asiatic Titmouse (Suthera suffusa.) Eastern Asia.

Foreign Birds: Titlark and White-eye.

COLLECTIONS.

572. White-Eye. (Zosterops simplex.) India and China. Inhabit woods and thickets, feeding on worms, insects and fruit. Active and pugnacious.

573. Titlark or Pipit. (Anthus maculatus.) Eastern Asia. Frequents stony and arid slopes, feeding on worms, slugs, and insects.

574. English Robin or Robin Redbreast. Temperate regions of Europe. Must not be confounded with American Robin. Excellent singer.

Foreign Birds: Thrushes.

COLLECTIONS.

575. Black Thrush. (Merula Mandrina.) Europe and Asia. Frequents hedges, thickets and gardens. Feeds on larvae, snails, worms, insects, and fruits. Imitates notes of other birds.

576. Rufous-tailed Thrush. (Merula Pallida.) Male and female. Eastern Asia. Good singer.

577. Ground Thrush. (Geocichla sibirica.) Eastern Asia. Terrestrial. Insectivorous.

578. Rock Thrush. (Rhyacornis Fulgurosa.) Eastern Asia. Builds nests in crevices of rocks. High mountains in summer, lower slopes in winter. Feeds on insects and fruits.

579. White-headed Thrush. (Chimmarrhornis Leucocephalus.) Eastern Asia.

580. Song Thrush. (Stachyrodopis Rubiceps.) Europe and Asia. Woods and meadows, near streams. Excellent singer.

581 Bushchat. (Pratincola Maura.) China and India. Very noisy and active. Inhabits pine forests. Feeds on snails, slugs, and insects.

582. Fruit Thrush. (Pycnonotus Sinensis.) Male and female. Easily tamed.

Foreign Birds: Bulbuls.

Bulbuls a branch of the Thrush family, belong chiefly to India, although some are found in Africa. Inhabit woods, jungles and gardens. Feeds on fruits and seeds, occasionally on insects. Good singers.

COLLECTIONS.

583. Crested Bulbul. (Otocompsa. Emeria.)

584. White-headed Bulbul. (Hypsipetes leucocephalus.) China and India.

585. Shortwinged Bulbul. (Hemixus ornensis and canipennis.) China and India.

Foreign Birds: Babblers.

Small, noisy, gregarious birds, belonging to Asia and Australia. Live in forests, feeding on insects. Sweet singers. Some imitate other birds.

COLLECTIONS.

586. Blue Babbler. (Dryonastes Bertynii and perpicellatus.) Eastern Asia.

587. Twittering Babbler. (Alceppe hucti.) China and India.
588. Long-billed Babbler. (Pomatorrhinus rupicellis.) Eastern Asia.
589. Crimson Babbler. (Throchalopterum elliotti.) Eastern Asia.
590. Hook-billed Babbler. (Myiophoneus caeruleus.) Asia.

Foreign Birds: Dayal and Pitta.

COLLECTIONS.

591. Dayal or Magpi Robin. Asia. Abundant in Ceylon. Inhabits wooded country. Chiefly on ground feeding on worms and insects.
592. Pitta or Ant Thrush. (Pitta maglotti.) Tropical regions of both hemispheres. Feeds on insects, preferably ants.

Foreign Birds: Chachalaca and Prairie Hen.

COLLECTIONS.

593. Chachalaca. A gallinaceous bird, easily domesticated; range throughout Texas and South America.
594. Prairie Hen. Similar in habits, coloration and form to American Prairie Hen. Native of China.

Foreign Birds: Thrushes, Finches, etc.

COLLECTIONS.

595. Asiatic Babbling Thrush. Various species found in the Himalayas, China and Formosa.
596. Brambling or Mountain Finch. Closely related to and resembling the Chaffinch.
597. Asiatic Warbler. (Suya Cringera,) found in the Himalayas and Sumatra.

Miscellaneous Chinese Birds, Resembling Their American Relatives in Habits, Form and Color.

Foreign Birds: (China.)

COLLECTIONS.

598. Jay.
599. Cuckoo.
600. Thrush.
601. Bobolink.
602. Titmouse.
603. Bunting (Brown).
604. Indigo Bunting.

COLLECTION **605.**

Foreign Birds: Heads.

Group of mounted Birds' Heads, assorted with view of studying structure of various Bills.

Duck — goose — coot—ruff (sandpiper family)—hawk—owl — crow — blue jay —pigeon—thrush—bee-eater.

COLLECTION **606.**

Foreign Birds: Feet.

Group of mounted Birds' Feet, assorted to show structure of typical Swimmers, Waders, Scratchers, Perchers, Birds of Prey, etc.

COLLECTION **607.**

Foreign Birds: Wings.

Group of mounted Birds' Wings, showing various characteristics of structure adapted to use.

COLLECTION **608.**

Foreign Birds: Tails.

Group of mounted Birds' Tails, showing various characteristics of structure adapted to use.

Miscellaneous Bird Nests, Collected After the Nesting Season, or After Desertion by the Parent Birds.

Birds: Nests.

COLLECTIONS.

609. Robin's nest.
610. Baltimore Oriole's nest.
611. Orchard Oriole's nest.
612. Wren's nest.
613. Chipping Sparrow's nest.
614. House Sparrow's nest.
615. Field Sparrow's nest.
616. Pewee's nest.
617. Catbird's nest.
618. Blackbird's nest.
619. Blue Jay's nest.
620. Skylark's nest.
621. Kingbird's nest.
622. Crow's nest.
623. Nest of Tailor-bird. The bird stitches together the edges of leaves with threads taken from palm leaves to sustain its nest of grass, cotton, wool, or hair.

To the Teacher:—

Use this blank page to insert additional collections 624 to 650, to be given in future Supplementary Catalogues.

Large Colored Charts Illustrating the Life of Some of the Large Birds.

328-a. Great Heron.

343-a. Flamingo.

COLLECTION **347-a.**

Ostrich Egg.

Ostrich Eggs are of great size, averaging three pounds each.

COLLECTION **367-a.**

Bald Eagle.

The Bald Eagle is represented in the coat of arms and on the coins of the United States.

INSECTS.

REFERENCE BOOKS.

Comstock—Manual for the Study of Insects.
Comstock—Insect Life.
Holtz—Nature Study.
Hodge—Nature Study and Life.
Howard—Insects.
Jackman—Nature Study.
Wilson—Nature Study.

INSECTS AND THEIR NEAR RELATIVES.

COLLECTION 650.

Arachnidae: Spiders.

1. Garden Spider. Found in large numbers in the gardens of the temperate regions of Europe and North America. Constructs a web, with radiating threads, in which it catches its prey.

2. Millipede. Lives in damp places and feeds on decaying matter, rarely upon growing plants. Europe and North America.

3. Giant Centipede. Tropical countries. Poisonous. Lives under stones, logs, and barks. Feeds on insects.

4. Harvestman. Common in most parts of the United States and Central Europe. Feeds on small insects. Perfectly harmless.

5. Scorpion. Nocturnal. Feeds upon spiders and other large insects. Sting poisonous. Warm countries. Common in southern part of United States.

6. Tarantula. Giant spider. Does not construct true web, but digs long tubes in the earth, which it lines with silk. Sting extremely poisonous. Tropical countries.

7. Nest of Trap-door Spider and Spider. Southern and Southwestern States. Digs tubes lined with layer of silk and provided with hinged lid in the ground. Hides in this nest to catch its prey.

COLLECTION 651.

Illustrations of Spiders.

Colored chart representing spider and web.

COLLECTION 652.

Hemiptera: Half-winged Insects.

1. Backswimmer. Floats on the surface of water, back downward. Feeds upon insects and other small animals. Inflicts painful stings with its sharp beak.

2. Water Scorpion. Lives among rubbish or on the stems of water plants, in ponds or in the quiet parts of our streams. Carnivorous.

3. Water Strider. Found on quiet streams and ponds on the surface of which it can move along rapidly. Feeds on smaller insects.

4. Cicada or Dogday Harvest Fly. Requires two years for its development. Larvae live on the juices from the roots of trees.

5. Giant Waterbug. Eastern United States. Very common. In quiet pools. Sucks blood of small aquatic animals. Attracted by electric lights.

6. Wheelbug. Southern States and Mexico. Very useful. Feeds on smaller injurious insects. Frequently found on cotton plants, which it protects by destroying its enemies.

7. Lantern-Fly. Brazil. Resembles butterfly. Phosphorescent. Emits beautiful light. Ladies fasten it in their hair as ornament. Lives among orchids, feeding on vegetable matter.

COLLECTION 653.

Neuroptera: Nerve-winged Insects.

1. Lace-winged-fly or Aphis-lion. Found on the leaves of shrubs and trees. Feeds on small insects. Especially destructive to plant-lice.

2. Ant-lion. Lives in sandy places. Forms funnel-shaped pits in the sand in which it catches its prey, the ant.

3. Caddice-fly. Common in the vicinity of streams, ponds and lakes. Builds nests of sticks and straw fastened together by silk which the larvae spin from the mouth. Feeds on small insects.

4. Dragon-fly. Darts back and forth over streams and wet places. Feeds on flies, gnats and mosquitoes.

5. Damsel-fly. Variety of dragon-fly.

6. May-fly. Found near rivers and lakes. In the larva and pupa state it lives a year or more in the water. Existence in the adult state very brief.

7. Dobson-fly. North America. In rapid, rock-bottomed streams. On land only by night. Much used as bait. Feeds on small aquatic worms and larval insects.

COLLECTION 654.

Diptera: Flies.

1. House-fly. The most familiar of the diptera. Abounds in our dwellings.
2. Mosquito. Larva aquatic. Feeds on decaying matter in water. Female adult sucks blood, while male is said to feed on sweets of flowers.
3. Drone-fly. Common about flowers. Larva lives in foul water, feeding on decaying vegetable matter.
4. Common Horse-fly. North America. Female annoys animals by its bite. Male harmless, feeding on juices of plants and trees. Larvae live in the earth or in water, feeding upon soft-bodied insects and water snails.
5. Brown Horse-fly. Food and habits like those of common horse-fly.
6. Robber-fly. Widely distributed. Most predacious of all insects. Catches and feeds on insects of all kinds, even its own species.
7. Crane-fly. Larvae live in the earth, in decomposing wood, or upon leaves of plants. Destroy grass and grain by injuring the roots. Adult flies are found in pastures and woods in late summer.
8. Blow-fly. Larvae found in meat and dead animals. Adult lives on animal matter exclusively. Destroys the Rocky Mountain locust.

COLLECTION 655.

Coleoptera: Beetles.

1. Ground-beetle. Surface of the ground, lurking under stones or rubbish. Feeds upon other insects.
2. Searcher Ground-beetle. On surface of ground, feeding upon other insects. Climbs trees in search of caterpillars.
3. Diving-beetle. Abounds in streams and ponds, floating in inclined position, head downward. Feeds upon other insects and attacks small fish.
4. Carrion-beetle. On the ground. Feeds upon decaying animal matter, but also upon living insects and snails.
5. Burying or Sexton-beetle. Buries dead birds, mice, etc. Female lays eggs on the carrion, upon which the larvae feed.
6. Rove-beetle. Found upon the ground under stones and other objects. Feeds upon decaying animal and vegetable matter.

COLLECTION 656.

Coleoptera: Beetles.

1. Common Stag-beetle.
2. Giant Stag-beetle. Found on trunk of trees. Live upon sap of trees and decomposing wood.
3. May-beetle or June-bug. Appears in large numbers in May and June. Does much injury by eating the foliage of trees.
4. Rose-beetle. Appears in early summer. Does much injury to roses and other flowers, shrubs and fruit trees.
5. Darkling-beetle. Found near decaying trees in dry and warm regions. Feeds upon decomposed wood.

COLLECTION 657.

Illustrations of Beetles.

Colored chart, May-beetle.

COLLECTION 658.

Coleoptera: Beetles.

1. Tiger-beetle. Southern Atlantic States. Concealed under logs and bark by day. Very predaceous. Larvae live in holes in the ground.
2. Dung-beetle. North America. Ground-beetle. Lives on manure.
3. Black Ground-beetle. On the ground, concealed under boards and stones during day. At night in search of prey, consisting of ants and other insects.
4. Blister-beetle. So called because dried bodies are used for making blister plasters. Feeds on leaves of potato and other plants.
5. Rhinoceros-beetle. Male has horn in middle of head. Larva lives on decaying wood. Adult feeds on sap of trees.
6. Hercules-beetle. Tropical America. One of the largest of insects. Food and habits like those of Rhinoceros-beetle.

COLLECTION 659.

Coleoptera: Longhorn Beetles.

1. Hickory Borer. Larva armed with sharp teeth fitted for boring into hard wood. Does much damage to hickory trees. Beetle feeds on pollen of golden rod and other plants.
2. Mottled Longhorn-beetle. Bores into pine trees, doing much injury.
3. Spotted or Milkweed-beetle. Larva devours the roots of milkweed, while beetle feeds on leaves of it.
4. Violet-beetle. Larva found in wood of conifers.

COLLECTION 660.

Hymenoptera.

1. Saw-fly. The saws on the abdomen of female used to make slits in leaves in which eggs are deposited. Feeds upon leaves of various trees.
2. Rose Gall-fly. Forms gall by puncturing the stem of the sweetbrier. Gall consists of a large number of kernels, in each of which a gall-fly is developed.
3. Red Wood-ant. Builds large ant hills in the forests. Lives upon all sorts of animal and vegetable matter.
4. Hornet. Builds nest of horizontal combs suspended one above the other and enveloped by a paper-like covering. Feeds upon insects, sweets of flowers, and juices of fruits. Sting very painful.
5. Hornet's nest.
6. Bumblebee. Builds nest in the ground in meadows. Bumblebee comb irregular, consisting of cocoons vacated by the young bees.
7. Wasp's nest. (Paper Wasp.)

COLLECTION 661.

Hymenoptera.

1. Honey Bee. Lives in communities consisting of three classes, queen, males and drones. Secretes wax from which cells are made. Highly valued for the honey they produce.
2. Brazilian Bee. Stingless. In large colonies. Builds in hollow trees.
3. Digger Wasp or Cicada-Killer. Largest and most ferocious wasp. Burrows deep hole in ground. Feeds on cicadas or harvest flies.
4. Mud-wasp. Builds cells of clay in all sorts of secluded places. Cells are provisioned with spiders, flies, and caterpillars.
5. Nest of Mud-wasp.

Illustrations of Hymenoptera.

COLLECTIONS.

662. Chart illustrating life of Honey Bee.

663. Chart illustrating life of Wood Ant.

COLLECTION 664.

Orthoptera: Straight-winged Insects.

1. Cockroach. Lives in cracks about the kitchen. Feeds upon almost anything especially provisions of the household, leaving an unpleasant odor upon them.
2. Grasshopper. Appears in great numbers in every region where plants grow and does much damage.
3. Katydid. Common in the United States during autumn. Lives on trees only, feeding on leaves. Its chirping is produced by the rubbing of a roughened file-like portion of one front wing upon the other. Chirps by night only.
4. Mole Cricket. United States and Central Europe. Burrows in the ground like moles. Feeds upon tender roots of various plants.
5. Common Cricket. The males make chirping musical sounds, by rubbing together the basal parts of the veins of the front wings.
6. Devil Horse or Praying Mantis. Tropical regions. Feeds upon smaller insects.

COLLECTION 665.

Orthoptera: Straight-Winged Insects. Locusts.

1. Red-legged Locust. Throughout North America. Migratory. Omnivorous and very injurious.
2. Clouded Locust. Resembles red legged locust. Abundant in Missouri Valley.

COLLECTION 666.

Orthoptera: Straight-winged Insects.

1. Walking Stick. United States Herbivorous. Found upon twigs to which they bear a striking resemblance. Sluggish in their movements.

2. Giant Walking Stick. Tropical regions.

3. Walking Leaf. East Indies. Bears strong resemblance to the leaves upon which it is found.

BUTTERFLIES AND MOTHS.

REFERENCE BOOKS.

Comstock—Manual for the Study of Insects.

Comstock—Insect Life.

Dickerson—Moths and Butterflies.

Eliot-Soule—Caterpillars and Their Moths.

Hodge—Nature Study and Life.

Holland—Butterflies.

Holland—Moths.

Holtz—Nature Study.

BUTTERFLIES.

COLLECTION 667.

Papilionidae: Swallowtails.

1. Tiger Swallowtail. Appears in May and June in all sections of the United States and Canada and Central Europe. Feeds on leaves of various trees.

2. Green Clouded Swallowtail. From May till August in North America and Central Europe. Spins a silken web on the leaf on which it abides.

3. Giant Swallowtail. All parts of the United States. Feeds upon the leaves of the hop vine in the North, in the South on the leaves of the orange trees, to which it does great damage.

4. Zebra Swallowtail. Found in eastern half of United States. Caterpillar lives on pawpaw.

5. Blue Swallowtail. Throughout the United States and Canada. Feeds on snakeroot.

COLLECTION 668.

Pierinae: Whites and Yellows.

1. Cabbage Butterfly. United States and Europe. Three-brooded. May be seen from May to November in gardens and pastures, but especially in cabbage fields.

2. Cloudless Sulphur. Common in the Southern States. Caterpillar feeds on cassia.

3. Orange Sulphur. Common in Southern and Western States Caterpillar lives on clover.

COLLECTION 669.

Lyceninae: Gossamer-winged Butterflies.

1. Blue Butterfly. Common everywhere in temperate regions from May to September. Three-brooded. Caterpillar feeds on clover and other leguminous plants.

2. Asiatic Blue Butterfly. Celebes.

COLLECTION 670.

Nymphalidae: Four-footed Butterflies.

1. Monarch or Milkweed Butterfly. Inhabits North and South America, the West Indies, Australia and the Malay Archipelago. Caterpillar lives on milkweed.

2. Regal Fritillary. Found during July and August in swampy meadows or adjacent fields. Single-brooded. Caterpillar feeds on violets.

3. Great-spangled Fritillary. Common in swampy places June to August. Caterpillar hibernates and feeds on violets.

4. Red Admiral. North America and Europe. From May to November. Double-brooded. Caterpillar lives on nettle and hop.

5. Thistle Butterfly. In almost all parts of the world. Double-brooded. Caterpillar feeds on thistle, burdock, sunflower, and hollyhock.

COLLECTION 671.

Nymphalidae: Four-footed Butterflies.

1. Mourning Cloak. Northern Hemisphere below the Arctic Circle. April to August. Two-brooded. Caterpillar hibernates and feeds on elm, willow and poplar.

2. Peacock Butterfly. Central Europe. April to August. Larva feeds on nettle.

3. Interrogation Butterfly. Common in the United States and Central Europe. From June to October. Larva lives on elm and hop vines.

4. Tortoise-shell Butterfly. United States, Canada and Northern Europe. Caterpillars live in swarms and feed on nettle.

5. Blue-eyed Grayling. Common during July and August in grassy fields and open woods. Caterpillar lives on grasses.

MOTHS.

COLLECTION 672.

Silkworms.

1. Chinese Silkworm. Furnishes silk for the whole world. Bred in China, Japan, Italy, France and Southern Europe. Feeds on mulberry and sometimes on osage orange leaves.

2. Io or Bull's eye Moth. Smallest of the giant silkworms. Larvae transform into silken cocoons attached to trees and shrubs. Eat leaves of various trees.

3. Polyphemus Moth. Cocoon enclosed in a leaf. Can be utilized for the manufacture of silk. Caterpillar feeds on oak, butternut, and various other trees.

4. Luna Moth. Cocoons are found under hickory, walnut, and birch trees, on the leaves of which the caterpillar lives. Cocoons contain but little silk.

5. Promethea Moth. Most common of giant silkworms. Feeds on leaves of our common fruit and forest trees.

6. Cynthia Moth. Introduced from Asia. Cocoons like those of the Promethea. Larva feeds on the Ailanthus trees, to which it does great damage.

7. Cecropia Moth. Largest of giant silkworms. From Atlantic Coast to Rocky Mountains. Lives on leaves of cherry, alder, willow, and many other trees.

COLLECTION 673.

Other Moths.

1. Currant Spanworm. Appears in great numbers in May and June. One brood. Larva does much injury to currant and gooseberry bushes.

2. Red Underwing. North America and Central Europe. Larvae and adults found on the trunks of various forest trees, on the leaves of which they feed.

3. Tiger Moth. Common in United States and Central Europe. Caterpillar hibernates. Feeds on herbaceous plants.

4. Death's-head Moth. Central Europe. September and October. Larva feeds upon flowers and leaves of the potato.

5. Hawk Moth. United States and Central Europe. Often flies at midday. Feeds on the leaves of many low-growing plants.

6. Pupa of Tomato Worm. United States. Best known of the sphinxes. Feeds on the leaves of tomato, tobacco and potato.

LIFE HISTORIES OF BUTTERFLIES AND MOTHS.

COLLECTIONS.

674. Glass case showing development of the Tiger Swallowtail. (See collection 667.)

675. Glass case showing development of Zebra Swallowtail. (See collection 667.)

676. Glass case showing development of Monarch or Milkweed Butterfly. (See collection 670.)

677. Glass case showing development of Cecropia Moth. (See collection 672.)

678. Glass case showing Life History of Mourning Cloak. (See collection 671.)

679. Glass case showing Life History of White Admiral. United States and South Canada. Larva feeds upon willow, cherry, apple, linden, etc.

680. Glass case showing Life History of Black Eastern Swallowtail. Atlantic States and Mississippi Valley. Caterpillar feeds on parsley, parsnips, and fennel.

681. Glass case showing Life History of Imperial Moth. United States. Feeds on hickory, oak, elm, maple. Larvae burrow into the ground to pupate.

682. Glass case showing Life History of Achaemon Sphinx. Throughout United States and Canada. From June to August. Caterpillar feeds on grape and Virginia creeper. Enters the ground to pupate.

683. Glass case showing Life History of Io Moth. (See collection 672.)

684. Glass case showing Life History of Limenites Ursula, found in the middle and Eastern portions of the United States. Head narrower than thorax, antenuae nearly as long as the body, ample wings without ocelli.

685. Glass case showing Life History of Kallima Inachis—Dead Leaf Butterfly. Resembles dry leaf in form and

color, makes use of this Mimicry to hide from its enemies.

686. Glass case showing Life History of Actias Luna. (See collection 672.)

FOREIGN BUTTERFLIES AND MOTHS.

COLLECTION **687.**

Foreign Butterflies.

1. Blue Morpho. Brazil and East India. Belongs to the largest and most beautiful butterflies. Wooded swamps. Flies at great height.

2. White Morpho. West coast of tropical South America.

3. Owl Butterfly. Tropical South America. When wings are folded, large round black spots (ocelli) on under side look like eyes of small owl. They protect insect from attacks of birds.

4-5. Bird-winged Butterfly. Celebes. Male and female. One of the largest and most beautiful butterflies.

6. Apollo. Western Central Europe. Found in mountainous regions only.

COLLECTION **688.**

Foreign Moths.

1. Thysania Agrippinia. Brazil. Largest specimens, measure a foot between tips of extended wings.

2. Attacus Atlas. Silkworm. India. Introduced in France and United States. Silk gray, coarse and brilliant. Larva feeds on oak and beech leaves.

3. Oleander Sphinx. Africa and Southern Asia. Larva feeds on oleander leaves.

To the Teacher:—

Use this blank page to insert additional collections 689 to 750, to be given in future Supplementary Catalogues.

COLLECTION **661-a.**

Glass case showing Life History of Honey Bee. (See Collection 661).

Large Colored Charts Illustrating Insect Life.

666-a. Various Insects.
685-a. Moths.
685-b. Silk Moths.

REPTILES.

REFERENCE BOOKS.

Cooper—Animal Life in the Sea and on the Land.

Ditmar—The Reptile Book.

Hartwig—The Sea and Its Living Wonders.

Jackman—Nature Study.

Linville-Kelly—Text Book in General Zoology.

Wood—Natural History.

COLLECTION 750.

Reptiles: Turtles and Tortoises.

1. Gopher Tortoise. Southern States. Burrows in the ground of sandy pine forests. Feeds on grass, vegetables and fruit. Flesh palatable.

2. Common Mud Turtle. Eastern North America from Canada to Texas. Inhabits quiet ponds and sluggish streams. Burrows into the mud of pond bottom at the approach of winter. Feeds on aquatic insects, minnows, fish-eggs, and worms.

3. Box Turtle. Eastern United States to Mississippi River. On land only in well shaded forests. In time of danger it withdraws head, legs, and tail completely. Feeds on snails, slugs, and caterpillars.

COLLECTION 751.

Reptiles: Alligators and Crocodiles.

1. Alligator. Gulf States. Burrows in sand banks. Builds mound of earth, grass, and moss in which it lays from 20 to 40 eggs. Its food consists of such mammals and aquatic birds as it can catch, but mostly of fish.

2. Crocodile. Food and habits the same as those of alligator.

COLLECTION 752.

Reptiles: Lizards.

1. Iguana. West Indies, Central, and South America. Among the largest of lizards. Climbing animal. Inhabits thick tree-tops and feeds upon fruit and soft vegetables. Flesh considered palatable.

2. Basilisk. Mexico and South America. Harmless. When frightened skips along surface of water at rapid rate.

3. Horned Toad. Western States. Inhabits deserts and arid regions. No toad, but lizard. Slow and sluggish. Feeds on insects.

4. Glass Snake. Southern States and Mississippi Valley. No snake, but legless lizard. When struck with stick, breaks into several pieces. Feeds chiefly upon insects.

COLLECTION 753.

Reptiles: Lizards.

1. Common Lizard. Western States. Very active, quick and graceful. Lives on ground catching insects, preferably meal worms.

2. Rock Lizard or Mountain Roamer. North America. On and among rocks. Color, being much like rocks, serves as protection. Very active and pugnacious.

3. Uta. North America, west of Great Plains. Most beautiful and graceful of lizards.

4. Striped Lizard. Pacific Slope. Runs over ground very swiftly in search of insects.

5. Mexican Striped Lizard. White stripes which disappear as the animal becomes older.

COLLECTION 754.

Reptiles: Serpents. Harmless Snakes.

1. Black Snake. Throughout the United States. Westward it changes color and is known as Blue Racer. Very active, good climber and swimmer. Feeds on small rodents, young birds, eggs, and frogs.

2. Corn Snake or Spotted Racer. Middle and Southern States. Constrictor. i. e., crushes its prey. Good climber. Feeds on rats and mice.

3. Garter Snake. Very abundant in United States and Canada. Inhabits low marshy places mostly. Feeds on frogs, toads, and small quadrupeds.

4. Green Snake. Middle States. Lives in meadows of high grass, feeding mostly on crickets and grasshoppers.

COLLECTION 755.

Reptiles: Serpents. Poisonous Snakes. Rattlers.

Very poisonous. End of tail provided with a rattle consisting of

joints of horny material developed out of the skin. Bring forth young alive. Inhabit rocky and hilly regions. In autumn they retire to some deep crevice among rocks or hole underground and lie in a torpid state until spring. Feed on birds, rabbits, squirrels, and rats.

1. Timber or Banded Rattlesnake. Eastern United States.
2. Tiger Rattlesnake. Southwestern United States.
3. Prairie Rattlesnake. Middle and Western States.
4. Skin of Rattlesnake.

COLLECTION 756.

Reptiles: Serpents. Poisonous Snakes.

1. Copperhead. Middle and Southern States. Inhabits woods and rocks. Feeds on small mammals, birds, and frogs.
2. Water Moccasin or Cotton Mouth. Southern States. Inhabits grassy margins of bayous and swamps. In summer they are seen hanging from low branches of trees over lakes and rivers. Feeds mostly on fish.
3. Boa Imperator. Central America. Northern and smaller variety of Boa Constrictor. Seizes and crushes its prey, consisting of small quadrupeds and birds.

ILLUSTRATIONS OF REPTILES.

Large Colored Charts Illustrating Life of Reptiles.

COLLECTIONS.

757. Crocodile.
758. Lizard.
759. Snake and Frog

WORMS.

REFERENCE BOOKS.

Holtz—Nature Study.
Jackman—Nature Study.
Linville-Kelly—Text Book in General Zoology.

COLLECTION 760.

Worms.

1. Earth-Worm. Ringed body without gills or feet, but with bristles arranged upon the rings for the purpose of progression. Nocturnal. Dependent upon moisture.
2. Log-Worm. Marine. Constructs long tubes of agglutinated sand among roots of eelgrass. Brilliant red color. Used for bait by English fishermen.
3. Scale-Worm. Marine. Has twelve pairs of rough scales on back which serve purpose of protection and respiration. Found in crevices and under stones on the rocky shores of bays and sounds.
4. Clam-Worm. Marine. One of the largest and most brilliantly colored worms of the Atlantic coast. Very voracious, seizing small animals in its beak-like jaws.

AMPHIBIA.

REFERENCE BOOKS.

Cooper—Animal Life in the Sea and on the Land.
Dickerson—The Frog Book.
Holtz—Nature Study.
Hornaday—American Natural History.
Jackman—Nature Study.
Linville-Kelly—Text Book in General Zoology.

COLLECTION 761.

Amphibia: Toads.

1. American Toad. North America. Lives on insects which it catches by darting out its long tongue. During winter lies in torpid state, concealed in holes and under stones.
2. Giant Toad. Mexico and South America. Appears at dusk, often in large numbers, in search of insects. Very loud and deep voice. Spends winter like American Toad.

COLLECTION 762.

Amphibia: Frogs.

1. Mexican Frog. Very abundant in Mexico. About the size of our bullfrog. Lives on ground in neighborhood of water. Feeds on insects and worms.
2. Tree Frog. Abundant in Eastern United States. Has sucking disc on end of each toe enabling it to climb trees. Protective coloration. Feeds on insects

COLLECTION **763.**

Amphibia: Salamanders.

1. Spotted Salamander. Central and Southern part of United States, and Mexico. Spends much time in water of shallow brooks and pools. On land found under fallen trees or stones. Feeds on insects. In torpid state in winter.

2. Axolotl. Mexico. Food and habits like those of Spotted Salamander.

To the Teacher:—

Use this blank page to insert additional collections 764 to 800, to be given in future Supplementary Catalogues.

Page 53.

Large Colored Charts Illustrating Amphibious Animals.

758-a. Amphibious Animals.
762-a. Green Water Frog.

CRUSTACEANS.

REFERENCE BOOKS.

Damon—Ocean Wonders.
Hartwig—The Sea and Its Living Wonders.
Holtz—Nature Study.
Jackman—Nature Study.
Linville-Kelly—Text Book in General Zoology.
Parker and **Haswell**—Text Book of Zoology.

COLLECTION 800.

Crustaceans. Lobsters.

1. Lobster. In waters of Temperate Zone. Lives in clear water along rocky coasts. Breathes by gills. Outgrows shell and changes it from time to time.
2. Flat or Broad Lobster. Japan. In moderately shallow water. Burrows deeply into the mud. Considered a delicacy in Japan.
3. Crayfish. Common in many of our rivers especially in limestone districts. Spends winter in holes in bank. Eats anything, animal or vegetable. Extensively used for food.

COLLECTION 801.

Crustaceans. Crabs.

1. American Spider Crab. Eastern coast of North America. Marine. Deeper parts of the sea, lurking among the sea weeds. Slow of progress. Feeds on small mollusks and other marine animals.
2. Spinous Spider Crab. British waters. Food and habit like those of American Spider Crab.
3. Thornback Spider Crab. Common on our coasts. Strong and sharp claws. Acts as scavenger of the sea, feeding on decaying matter. Very voracious.
4. Japanese Thornback. Japan.

COLLECTION 802.

Crustaceans. Crabs.

1. Edible Crab. Plentiful around our rocky coasts. Most pugnacious and vicious of crabs. Armed with two strong pricking claws. After molting or shedding its shell it is perfectly helpless and easily falls a prey to its enemies. At this stage it is commonly known as the Soft Shell Crab.
2. Montagu's Crab. Common on our coasts. Turns over stones looking for smaller marine animals. Shell and claws very strong considering size of animal.
3. Mole Crab. Eastern coasts of North America. Sandy beaches, burrowing in the sand, always backward.

COLLECTION 803.

Crustaceans. Crabs.

1. Shore Crab. Common on coasts of North America. Marshes and waters of shallow bays. Very voracious, leaping upon its prey, which consists of smaller marine animals.
2. Swimming Crab. Warmer seas. Remarkable speed in swimming, chasing after its victims, which are smaller crustaceans, and other marine animals.
3. Pea Crab. Lives within the shells of mussels and other bivalves inflicting no apparent injury to its host. Thought to feed upon the juice of the mollusk whose shell it inhabits.
4. Fiddler Crab. Salt marshes, burrowing deeply in the mud. In the males one claw is very large, held by the animal when disturbed, like a violin bow. Great fighter.

COLLECTION 804.

Crustaceans. Crabs.

1. Sand Crab. Burrows in the sand along the sea shore. Resorts to water only to deposit eggs. Very swift runner.
2. Yellow Crab. Japan. Marine. Feeds on smaller crustaceans.
3. Woolly Crab. California and Mediterranean. Marine. Seldom approaches the shore, preferring the deeper waters. Feeds on marine animals.
4. Hairy Crab. Warmer seas. Hides under sponges, shells and other marine substances.
5. Satin Crab. Japan. Habits and food like those of the preceding two crabs.
6. King or Horseshoe Crab. Philippine Islands. Found in clear water near the coast, often half buried in the sand. Breathes by gills. Long, sharp tail spine used for arrows or lances.

7. Rhinoceros Crab. West Indies. One of the largest of crabs. Eyes placed wholly on underside of head.

COLLECTION 805.

Hermit Crabs.

Abdomen not covered with hard shell. For their protection hermit crabs inhabit shell of some mollusk. When grown too large for their houses they seek another shell. Very pugnacious.

1. Common Hermit Crab. Common on coasts of North America and England.
2. Hairy Hermit Crab.
3. Mole Hermit Crab.
4. Red Hermit Crab.

COLLECTION 806.

Crustaceans: Crabs.

1. Northern Rock Crab. Eastern Coast of United States. In open waters. Strong and heavy. Valued as article of food.
2. Green Crab. At home in the marshes and waters of shallow bays. Poor swimmer.
3. Lady Crab. Lives on sandy bottom of shallow waters. Powerful and active swimmer.

COLLECTION 807.

Crustaceans. Shrimps.

1. Common Shrimp. Found in great numbers in Europe and North America. Color like the sands upon which it lives. Used as food. Shrimp fishing important industry on our coasts.
2. Fairy Shrimp. One of the most common of fresh water shrimps. Beautifully colored. Inhabits pools.

COLLECTION 808.

Crustaceans. Sandflea, Woodlouse, Etc.

1. Sand-flea. Found hopping about driftwood and sea weed on the sandy beaches. Lives on decaying animal matter.
2. Wood-louse. Plentiful in damp places under logs of wood or decaying timber.

COLLECTION 809.

Crustaceans. Barnacles.

1. Acorn Barnacle. Found in all seas. When young animals swim about; when older attach themselves to vessels, rocks, shells and even large sea animals.
2. Goose Barnacles. In all seas. Hangs from long muscular stalk. Attaches itself to seaweed, driftwood, or the bottom of vessels.

MOLLUSKS.

REFERENCE BOOKS.

Cooper—Animal Life in the Sea and on the Land.
Furneaux—Life in Ponds and Streams.
Hardy—Hall of Shells.
Hyatt—The Oyster, Clam and Other Common Mollusks.
Holtz—Nature Study.
Woodward—Manual of the Mollusca.

COLLECTION 810.

Bivalves.

Characterized by absence of head and possession of two nearly equal lateral valves. Apex of valve always turned toward mouth.

1. Oyster. Usually found adhering to rocks or other fixed objects in shallow water along the seacoast. Used for food.
2. Thorny Oyster. Armed with spines. Tropical and Subtropical seas.
3. Mother-of-Pearl. Nacreous shell of pearl oyster. Madagascar, Southern and Southeastern Asia, South Sea Islands, Panama and the West Indies.
4. Sea-water Mussel. Found in immense quantities on rocks in the eastern and western coasts of North America, North and Baltic Seas, Mediterranean and Eastern Asia. Used as food in Europe more than in America.
5. Pinna. Long, triangular shells. Spins a very strong byssus resembling silk. All warm seas.
6. Pearl Oyster Shell showing pearl.
7. Byssus of Pinna on card.
8. Hammerhead Oyster. Eastern Asia. When young does not differ much in shape from other "wing" shells, but as it grows it develops "ears" so as to make the shell look like a hammer.
9. Vulsella or Sponge Shell. Red Sea. This species is found in sponges.

COLLECTION 811.

Mollusks: Bivalves.

1. Mactra or Giant Clam. Shell and mollusk in alcohol. Eastern Coast of United States. Burrows through the sand by means of a well-developed foot. Was used by the Indians as a hoe with which to hill their corn.

2. Tresus. Clam with large mounted siphon. North Pacific. The siphon is a prolongation of the margins of the mantle.

3. Venus or Quohog. Eastern United States. Large clam. Extensively eaten on and near the Atlantic Coast.

COLLECTION 812.

Bivalves.

1. Fresh-water Mussels. In still water or running streams. Shell internally pearly. Used for pearl buttons. Sometimes contain pearls.

2. Pecten or Scallop. In shallow places, among the eelgrass in seawater. Muscle holding together valves is edible. Lower valve convex, while the upper is plain or concave.

3. Cockle. Sandy bays near low water. Flesh tasteless and leathery. Eaten in England.

4. Razor Clam. Sandy shores along New England Coast. Digs vertical burrow into the sand. Used by some as food.

5. Tridacna. Indian and Central Pacific Ocean. Very large specimens, weighing up to 500 pounds. Animal eaten by South Sea Islanders.

COLLECTION 813.

Mollusks: Bivalves.

1. Edible Clam. In all northern seas. Lives in deep burrows in firm mud or sand. Through siphons extended to mouth of burrow, water and minute animals in it are drawn into shell. Flesh very palatable.

2. Truncated Clam. Eastern coast of United States. Lives below low-water mark.

3. Bear's Paw Clam. Indian and Central Pacific. Differs but slightly from Tridacna. Ribs on outside smaller and more numerous.

4. Angel Wings. Eastern and western coast of North America. Bores with its foot in sand, clay and limestone. Flesh edible.

5. Amusium or Japanese Pecten. Japan.

6. Saddle-Shell. Philippine Islands. Sandy shores. Shell formerly used as window panes by the inhabitants of the Philippines.

7. Pieces of rock bored by Pholas or Angel Wing Shell.

8. Teredo or Ship-worm. Florida. Worm-like bivalve with two long siphons each armed with a shelly pallet. Bores into wood, lining its channel with a calcareous deposit. Does great damage to dikes, wharves, and hulls of ships

9. Lithodomus or Rock-Borer. Mediterranean. Luminous. Bores into corals, shells, and hardest limestone rocks. Flesh edible.

COLLECTION 814.

Mollusks: Bivalves.

1. Tellina or Sun Shell. West Indies. Either valve presents in miniature a picture of the rising sun.

2. Aspergillum or Watering Pot Shell. East Indies. The tapering tube at its larger end terminates in a perfect sprinkler.

3. Mammouth Watering Pot Shell. Red Sea.

4. Tagelus, Florida. Common on eastern coast, buried in the sand.

COLLECTION 815.

Gasteropods.

Univalves. Free and locomotive. Locomotion effected by a muscular, either disc-like or fin-like, foot. The latter enables them to swim.

1. Chiton. In shallow waters of Atlantic and Pacific Coasts. Flattened body, covered above with a shell consisting of eight joints.

2. Abalone. Tropical seas. Abundant on coast of California. Shell lined with mother-of-pearl. Used as money by South Sea Islanders. Animal eaten in France.

3. Animal occupying abalone shell.

4. Limpet. Attached to rocks in all seas. Eaten by inhabitants of European coasts; used as bait in America.

5. Key-hole Limpet. Near the shores of tropical seas. Hole near apex of shell.

COLLECTION 816.

Mollusks: Gasteropods.

1. Scurria or Owl Shell. California. One of the most attractive of the limpets.

2. Bulla or Bubble Shell. California. Frequents sandy or muddy bottoms near the shore, burying into the sand or hiding beneath masses of sea-weed.

3. Aplysia or Sea-Hare. Florida. Rudimentary, translucent shell. Emits nauseous odor.

4. Tethys or Naked Mollusk. Mediterranean. No shell. Animal almost transparent. Rapacious, feeding upon small mollusks and crustaceans.

5. Dentalium or Tooth Shell. California. Shell tooth-shaped. Inhabits the sandy bottoms of the sea.

COLLECTION 817.

Gasteropods: Topshells.

1. Trochus. In all seas. Shell pyramidal. Mass of mother-of-pearl after outer shells have been removed. Animal feeds on seaweeds.

2. Turbo. Near the shores of tropical seas. Shell turbinated. Feeds on seaweeds.

3. Mason-shell or Shell-carrier. Indian Ocean. Covers itself with all sorts of objects—shells, stones, bits of coral, etc. Agglutinates them with substance secreted from shell, to protect itself.

4. Ianthina or Violet Snail and Eggs. Secretes a violet colored fluid. Lives in mid-ocean. Floats at the surface by means of a raft it constructs by forming and uniting air bubbles of hardened mucus. Raft contains eggs.

5. Section of Trochus showing interior.

6. Turbo Marmoratus. Philippines. Fine large shells of this species formed the drinking goblets of the Scandinavian monarchs.

COLLECTION 818.

Gasteropods.

1. Astralium or Cartwheel Shell. Japan. The whorl is covered with a row of long spines.

2. Scalaria or Precious Wentle Trap Shell. China and Australia. Turreted, consisting of many whorls provided with numerous transverse ribs.

3. Solarium or Prospective Shell. China and Australia. Resembles trochus but is not pearly.

4. Cerithium or Herald's Horn. Australia. Abundant on sea bottoms where algae are numerous.

COLLECTION 819.

Gasteropods.

1. Voluta or Music Shell. Derives its name from fine dark lines interspersed with blotches on shell. Tropical and subtropical sea. Snail predacious and carnivorous.

2. Oliva or Olive Shell. Tropical seas. Shell porcellanous. Snail carnivorous.

3. Harpa or Harp Shell. Tropical seas except the Atlantic. Snail beautifully colored. Carnivorous.

4. Mitra or Mitre Shell. Resembling a bishop's mitre. Tropical and subtropical. Reef-shell, lurking in holes and crevices under seaweed.

5. Melo or Melon Shell. Indian Ocean and Australia. Brings forth its young alive. Predacious and carnivorous.

6. Crown Shell. Warmer seas. Food and habits like those of Voluta.

7. Section of Voluta showing interior.

8. Section of Oliva showing interior.

9. Oliva Maura or Dark Olive. Ceylon and Mauritius. Sometimes the shells of this species become almost black.

COLLECTION 820.

Gasteropods.

Murex. Tropical and subtropical seas of Old World. Most rapacious of mollusks. Does great damage to oyster beds, boring through the shells of oysters.

1. Black Murex.

2. Section of Rose Murex showing interior.

3. Section of White Murex showing interior.

4. Urosalpinx or Drill. Eastern coast of United States. Very injurious to oyster beds. Settles down on oysters, bores hole through their shell and eats soft parts.

5. Purpura. All parts of the world. Destructive to oyster and mussel beds. Ancients obtained purple dye from it.

COLLECTION 821.

Mollusks: Gasteropods.

1. Fasciolaria or Tulip Shell. Tropical and subtropical. Southern coast of United States. Some specimens two feet long.
2. Pyrula or Pear Shell. West Indies, Philippines and eastern coast of United States. Egg cases long strings of flattened capsules cast on the shore.
3. Egg Case of Pyrula.
4. Fulgur or Winkle Shell. Variety of pear shell. Atlantic coast of United States. Snail used by fishermen as bait.
5. Whelk. Arctic and Temperate seas. New England coast. Eggs laid in capsules piled up in a heap, called seacorn. Snail used in England as food, in America as bait for codfish.
6. Winkle Shell and Mollusk in alcohol.
7. Ranella or Frog Shell. Japan. Useful as scavenger of the sea, feeding on decaying animal matter.

COLLECTION 822.

Gasteropods.

1. Conus or Cone Shell. All tropical seas. Sandy coast. Predaceous and carnivorous. Bite poisonous.
2. Terebra or Auger Shell. East Indies, west coast of Tropical America. Carnivorous.
3. Periwinkle. On seashore in all parts of the world. Very useful, clearing the oysterbeds of seaweed. Used as food in Europe.
4. Turritella or Screw Shell. In all waters. Feeds on animal matter in the ocean.

COLLECTION 823.

Mollusks: Gasteropods.

1. Worm-shell. Shores of the United States. Shell irregular spiral. Attaches itself to submarine objects.
2. Vermetus on Abalone.
3. Vermetus on Oculina Coral.
4. Vermetus in clumps. Japan.

COLLECTION 824.

Gasteropods.

1. Tiger Cowry or Porcelain Shell. Among the coral reefs of the Pacific Ocean.
2. Money Cowry. Tropical seas. Used in barter by native tribes of Western Africa.
3. Strombus or Wing Shell. On reefs in tropical waters. Feeds on dead and decaying animal matter. Shells ground into powder for the manufacture of porcelain.
4. Scorpion shell. Indo-Pacific waters. Snail carnivorous. Shells used by East Indians as battle axes.
5. Mole Cowry. Indian Ocean. Littoral. Hides itself under stone and branches of coral. Carnivorous.
6. Argus or Eyed Cowry. Indian and Central Pacific. Food and habits like those of mole cowry.
7. Arabic Cowry. Red Sea, Australia and Japan.
8. West Indian Cowry. Bahamas.
9. Section of Scorpion Shell showing interior.

COLLECTION 825.

Mollusks: Gasteropods.

1. Ovula or Egg Shell. Bahamas. Attaches itself to various species of gorgonia upon the polyps of which it preys.
2. Flamingo Tongue. West Indies. Small Egg Shell.
3. Ovula ovum or Large Egg Shell. Fiji Islands. Used for personal or household ornaments by inhabitants of South Sea Islands.
4. Trivia or Cross Roads Shell. In all warm seas. Small shell with riblets on the back. Subgenus of cowry.
5. Mouse Cowry. Naples.
6. Serpent Head Cowry. Australia. The flattened shell looks somewhat like the spreading hood of the Indian Cobra.
7. Lynx Cowry. Singapore.

COLLECTION 826.

Gasteropods.

1. Cassis or Helmet Shell. Tropical seas. Snail feeds on bivalve mollusks. Shells used in making cameos.
2. Dolium or Tun Shell. Tropical and Subtropical seas. Snail lives on animal food.
3. Triton or Trumpet Shell. In all Tropical and Subtropical seas. Scavengers of the ocean, feeding upon decaying animals. Shell used as trumpet by fishermen in the Mediterranean.

4. Section of Dolium showing interior.

5. Operculum or Shell Door of Triton. The operculum is a lid covering the aperture of the shell.

COLLECTION 827.

Gasteropods: Pond and Land Snails.

1. Ampullaria or Apple Shell. Tropical countries. Amphibious. Ponds and marshes. Have both lungs and gills.

2. Limnaea or Pond Snail. Temperate regions. Ponds and rivers. Comes to the surface to breathe. Feeds on aquatic plants.

3. Melania or Black Snail. Fresh water lakes and rivers of tropical regions. Lives on aquatic plants.

4. Paludomus. Variety of Melania. Ceylon.

5. Neritina. Warmer regions. Inhabits foliage of trees overhanging rivers and ponds.

6. Pupa. Land Snail. Almost everywhere. Lives in woods. Herbivorous.

COLLECTION 828.

Mollusks: Gasteropods: Pond and Land Snails.

1. Helix or Common Garden Snail. Temperate regions. Terrestrial and herbivorous.

2. Planorbis. Pond Snail. Moves about in still waters in a sluggish manner.

3. Physa. Pond Snail. Common in United States. Amber colored vortex. More active than Planorbis.

4. Goniabasis. Fresh-water Snail. Central United States.

5. Io. Frest-water Snail. Mountainous regions of Virginia and Tennessee.

6. Section of Helix showing interior.

COLLECTION 829.

Mollusks: Pond and Land Snails.

1. Limax or Common Garden Slug. Air-breathing. Small rudimentary shell. Troublesome in gardens.

2. Balimus. Barbadoes. A land snail. Widely distributed. Mollusks deposit eggs on leaves and cement leaves together to protect the eggs.

3. Painted Helix. Cuba.

4. Auricula or Ear Snail. India. Terrestrial, usually living near the sea in salt marshes.

5. Cyclophorus. Philippines. Land snail living in damp places. Air-breathing.

COLLECTION 830.

Cephalopods.

1. Chambered Nautilus. Tropical seas. Spiral shell. Interior divided by partitions into numerous chambers. Animal occupies outer shell. Feeds upon crabs, urchins, etc.

2. Pearly Nautilus. Chambered nautilus whose outside striped coating has been removed and remaining shell polished.

3. Pearly Nautilus in sections showing the chambers. See Holmes' poem.

4. Squid. Eastern coasts of United States. Two long tentacular and eight short arms. Swim in large numbers following young mackerel and herring, on which they feed. Used as bait.

COLLECTION 831.

Mollusks: Cephalopods.

1. Octopus or Devil Fish. Mediterranean Sea. No shell. Eight or ten arms provided with suckers or hooks. Eyes sessile, furnished with a lense. Carnivorous. Some specimens become very large having a spread of twenty-five feet.

2. Argonauta or Paper Nautilus. Mediterranean. Eight arms, two of which are expanded at the end and clasp the shell. The male which is much smaller than the female has no shell.

3. Sepia or Cuttle Fish. Mediterranean. Internal shell. Large eyes. Ten arms furnished with suckers, by means of which it secures its prey, young fish, crabs, etc. Has ink bag, from which it throws out a dark liquid enabling it to escape observation.

4. Ommastrephes or Flying Squid. Eastern Coast of United States. Ten arms provided with suckers. Darts out of water, often to such a height as to fall on the decks of vessels.

ECHINODERMS.

REFERENCE BOOKS.

Cooper—Animal Life in the Sea and on the Land.

Damon—Ocean Wonders.

Hartwig—The Sea and Its Living Wonders.

Hyatt—Common Hydroids, Corals and Echinoderms.

COLLECTION 832.

Starfishes.

1. Common Starfish. Western coast of North America. Five rays. Tubes on under surface of rays serving as feet. Broken rays replaced. Feeds on aquatic animal matter. Particularly fond of oysters and clams.

2. Brittle Starfish. Everywhere in Northern Hemisphere. Breaks up its rays when touched or alarmed. Broken rays replaced by natural growth.

3. Spiny Starfish. Lower California. Covered with tufts of tiny spines.

4. Sun-star. Northern regions of Atlantic and Pacific.

5. Serpent-star. When alarmed or caught breaks up its rays, which are replaced by natural growth.

6. Goniaster. Central Pacific coast. Pentagonal. Arms project but slightly. Two rows of suckers.

COLLECTION 833.

Echinoderms: Starfishes.

1. Stichaster or Sea Star showing development of arm. Chili. Common all along the west coast of South America.

2. Serpent Star, showing development of arm.

3. Ophiura or Serpent Tail. New England Coast. Long armed with small disks. Arms often eight times as long as disk.

4. Astrophyton or Medusa's Head. Maine. Five arms divided and subdivided into a large number of branches. No arm spines.

5. Astropecten or Star Comb. China. Five-rayed star, the upper surface of which is covered with beautiful star-shaped points. Edges of arms set with two rows of sharp pointed teeth.

COLLECTION 834.

Echinoderms: Starfishes.

1. Pycnopodia or Wheel Shaped Star. California. Large round disk with from fifteen to thirty arms. Upper surface covered with short, sharp spines.

2. Solaster or Sun Star. Bay of Fundy. From nine to eleven tapering rays.

3. Linkia or Spineless Star. Most numerous in tropical regions. No spines. Body smooth or uniformly granular.

4. Oreaster or Mountain Star. Mexico. Arms project but slightly. Two rows of suckers.

5. Luidia or Brittle Star. Florida. This species is known for its propensity to break into innumerable fragments when brought into contact with the air. Rays four times the length of disk.

COLLECTION 835.

Sea Urchins.

Echinoderms without arms and without a stalk. Regular sea urchins with globular shell. Live on rocky coasts. Burrow into limestone rocks and coral reefs until they lie in a cavity fitting their bodies. The flat-bodied or cake urchins are found on sand. Tube-feet.

1. Green Sea Urchins, with spines. North Atlantic Ocean.

2. Green Sea Urchins, spines removed. North Atlantic Ocean.

3. Purple Sea Urchin. Atlantic and Pacific Coasts.

4. Sand Dollar. Central Atlantic and Pacific Coasts.

5. Cake Urchin. Pacific Coast.

6. Keyhole Urchin. Tropical seas.

7. Heart Urchin. All oceans.

8. Sea-beaver. Pacific Ocean. Variety of Heart Urchin.

9. Spines of Sea Urchins. Various sizes.

10. Club Spine Urchin. Bahamas. Massive solid spines.

11. Phyllacanthus or Leaf Spine Urchin. Mauritius.

12. Sea Biscuit.

COLLECTION 836.

Crinoids.

Lowest class of echinoderms. Few living forms. Found in deep water. Stem consists of many flattened calcareous joints. Pinnules provided with ciliae or lashes produce a current of sea water which conveys to them their food.

Pentaerinus Decorus. Carribbean Sea.

COLLECTION 837.

Echinoderms: Sea Cucumbers.

Sea Cucumbers. Least radiate of echinoderms. Deep water forms Mouth surrounded by branched tenta-

cles. Feeds on minute aquatic animals and vegetable matter.

COLLECTION 838.

Jelly Fishes.

Bodies gelatinous, composed for the most part of water. When taken from water melt away, leaving thin film. Phosphorescent.

1. Portuguese Man-of-War. Tropical oceans. Transparent, pear-shaped bladder, from which hang a variety of appendages. These are used for various purposes, some for swimming, some for producing eggs, some for procuring food, and others for eating.

2. Velella or Float. Oblong disk body supported by a thin plate, from which raises a thin diagonal crest, acting as a sail. Floats at the surface.

3. Aurelia. Jelly-fish. New England waters. Body disk-shaped and of creamy white color. Four oral tentacles commonly carried extended from a central mouth-opening.

COLLECTION 839.

Hydroids.

Simplest form of zoophytes or flower animals. Originally produced from a single egg, each species by the formation of successive buddings grows up to a populous colony. Remarkable for their beauty of form.

1. Aglaophenia. Ostrich Plume. Pacific Coast.

2. Plumularia. Plume Hydroid. New England Coast.

3. Sertularia, Squirrel-tailed Hydroid from New Jersey Coast to Arctic Ocean.

4. Clava. From Long Island Sound northward.

COLLECTION 840.

Miscellaneous Assortment of Sea Weeds.

Sea Weed. Any member of the class Algae, very abundant, especially in warm seas, are often exceedingly delicate and beautiful. Some varieties also called sea moss.

CORALS.

REFERENCE BOOKS.

Cooper—Animal Life in the Sea and on the Land.

Damon—Ocean Wonders.

Hartwig—The Sea and Its Living Wonders.

Hyatt—Common Hydroids, Corals and Echinoderms.

Holtz—Nature Study.

Jackman—Nature Study.

CORALS.

During life skeleton of corals covered with soft flesh, the surface of which is thickly studded with star-like animals called polyps. Deep water of warm oceans.

COLLECTION 841.

Corals: Hydrocorallinae.

Beautiful forms. Make important contributions to coral reef. Produce coral composed of calcareous fibers travesed by canals. As one polyp dies, another succeeds it, and a partition is formed separating the new cup occupied by a polyp from the old, so that in time the pits become deep, but are divided by a series of transverse partitions.

1. Districhopora, Kingsmill Island.
2. Stylaster, Samoa.
3. Millepora, Hayti.

COLLECTION 842.

Corals: Astraeidae.

True or Stony Corals. Reef builders. These polyps have, by their co-operation, constructed vast deposits of limestone. Resemble sea anemones. Found in the coral reef seas.

1. Isophyllia, Bahamas.
2. Symphyllia, West Indies.
3. Manicina, West Indies.
4. Meandrina or Brain Coral, Bermudas.
5. Merulina. East Indies.
6. Mussa. Tonga Islands.
7. Large-leaf Coral (Euphyllia). Singapore.
8. Angle-Star (Goniastraea). Fiji Islands.
9. Saw-Star (Prionastraea). East Indies.

COLLECTION 843.

Corals: Fungidae or Mushroom-Coral.

True or Stony Corals. Reef builders. Sometimes grow in simple leaves attached to the side of other coral rocks. Found in the coral reef seas.

1. Fungia, Zanzibar.
2. Herpetholita, Java.
3. Peacock-Coral. Singapore.
4. Tube-bearing Coral. (Hydnophora). Singapore.
5. Mushroom-Coral. (Pachyseris). Samoa.

COLLECTION 844.

Corals: Miscellaneous.

1. Oculina. Reef-builder, Bermuda.
2. Madrepore or Tree Coral. Forms banks miles in extent near western end of Florida Keys.
3. Seriatopora. Resembles the Tree-Coral. Grows in massive forms in the Sandwich Islands.
4. Montipora, Tahiti.
5. Variously pored Coral (Pocillapora). Samoa.
6. Hollow-pored Coral (Alveapora). Samoa.
7. Porous Coral (Porites). Sandwich Islands.

COLLECTION 845.

Corals: Gorgonidae.

Form foot-secretions, separable from animal layer covering them. Hues various and brilliant. Star-like polyps.

1. Red Coral. Mediterranean Sea. Precious coral of commerce used for ornaments.
2. Gorgonia or Sea-fan. Tropical and subtropical seas. Consists of many lateral branches, forming a net-work of great fineness.
3. Sea-whip. Tropical and subtropical seas.
4. Slave Whip (Antipathes). West Indies.

This species braided was used as a whip with which slaves were beaten.

5. Organ-pipe Coral. Singapore. Gorgonia forming a jointed calcareous tube. Tubes connected by thin, flat plate. When alive, a bright purple polyp protrudes from each tube.
6. Sea Pansy (Renilla). Panama.
7. Sea Pen (Penuatula). Off George's Banks.
8. White Sea Fan (Leptogorgia). Panama.
9. Woven Fan (Plexaura). Caribbean Sea.

COLLECTION 846.

Sea-Anemone.

Sea-Anemone. Tropical seas. Tentacles disposed in regular circles, tinged with bright colors, and resembling petals of our most beautiful flowers. Attached to rocks. Voracious, feeding on almost any kind of small aquatic animals that come within its reach.

SPONGES.

REFERENCE BOOKS.

Cooper—Animal Life in the Sea and on the Land.

Hartwig—The Sea and Its Living Wonders.

Holtz—Nature Study.

Hyatt—Commercial and Other Sponges.

SPONGES.

Live sponges consist of jelly-like bodies united in a mass and supported by a framework of horny fibers and needle-shaped objects called spicules. Found in all waters. Sponges for domestic use come from the Red and Mediterannean Seas, the Bahamas and Florida.

COLLECTION 847.

Sponges: Horny Sponges.

Include all our commercial forms. Skeleton consists of horny fibers. Generally found in a few fathoms of water, on some rock or coral bottom.

1. Grass Sponge. Coast of Florida. Cheapest commercial sponge.
2. Anclote Grass Sponge. Gulf of Mexico.
3. Sheep's Wool Sponge, Florida.
4. Cuba Velvet Sponge, West Indies.
5. Hardhead Sponge, Florida.
6. Hircina. Florida.

The variety of form in this species from the flat and spreading to the vase-shaped and branching forms is almost endless.

COLLECTION 848.

Sponges: Horny Sponges.

1. Florida Violet Sponge, Florida.
2. Reef Sponge, Algoa Bay.
3. Rope Sponge. West Indies.
4. Wire Sponge, Gulf of Mexico.
5. Elephant Ear, Mediterranean Sea. One of the most valuable toilet sponges.
6. Sponge imbedded in coral. Coast of Florida.

COLLECTION 849.

Sponges: Horny-Silicious Sponges.

The skeletons are formed of solid horny fibers and silicious or quartz-like spicules. Too coarse to be of commercial value.

1. Pipe Sponge, Bahamas.
2. Finger Sponge, West Indies.
3. Loggerhead Sponge, West Indies.
4. Fringing Sponge, West Indies.
5. Golden Sponge, Algoa Bay.
6. Violet Sponge, Bahamas.
7. Sea-Cake (Suberites). Cape Cod. Only sponge form which can subsist on the shifting sands. Pores so small that sand can not enter.

COLLECTION 850.

Sponges: Silicious or Glass Sponge.

The highest order of sponges. Have the skeleton almost entirely composed of silicious spicules.

1. Venus Flower Basket, Philippines.
2. Glass Rope Sponge, Japan.
3. Sulphur Sponge (Cliona). Trinidad. Boring sponge. Penetrates shell of mussels, encloses and dissolves it. Bores also into lime-stone.
4. Red Beard Sponge (Macrocliona). Forms branching masses a few inches in height.
5. Sugar-Loaf Sponge (Tethya). Buzzard Bay. The threads at the bottom are curled together in a sort of wool. This catches all the small stones sifted out of the mud and enables the sponges to remain right-side up.

FISHES.

REFERENCE BOOKS.

Hornaday—American Natural History.

Hartwig—The Sea and Its Living Wonders.

Jordan—Guide to the Study of Fishes.

Linville-Kelley—Text-book in General Zoology.

COLLECTION 851.

Fishes: Spiny-finned Fishes. Bass and Sun-fish.

1. Black-bass. Eastern United States and Canada. Fresh-water fish. Strong and courageous. Feeds on other fishes. Excellent game fish.
2. Sun-fish. Eastern United States. Ponds, brooks, and rivers. Beautifully colored, when taken from water.

COLLECTION 852.

Fishes: Spiny-finned Fishes. Perch and Blue-fish.

1. Pirate Perch. Northeastern Section of United States. In lakes, ponds, and fresh water bays. Smallest of perches.
2. Blue-fish. From Maine to Florida. Sea water fish. Near the coast. Very rapacious and destructive to other fishes. Fine food fish.

COLLECTION 853.

Fishes: Spiny-finned Fishes.

1. Pompano. Southeastern coasts of United States. Very common on coasts of Florida. Food consists mainly of small shell-fish. Delicious fish for the table.
2. Silver-Moon Fish. Florida coasts. Body compressed and thin.
3. Sword of Sword-fish. Sword-fish found in all warmer seas. Snout elongated into sword-like formation, a very dangerous weapon. Very pugnacious. Feeds on smaller fishes, mackerel, blue-fish, etc. Flesh sliced and salted and considered good food.

COLLECTION 854.

Fishes: Spiny-finned Fishes.

1. Gurnard. All warm and temperate seas. Finger-like appendages of pectoral fins used to feel the ground in search of crustaceans and other small marine animals. Shallow waters. Good food fish.

2. Sand-eel or Lance. Eastern coast of North America. In large numbers on sandy shores. When alarmed bury themselves in sand, darting in and out like arrows.

COLLECTION 855.

Fishes: Pike Family.

1. Muskallunge. Great Lake region. Fresh water fish. Voracious and destructive to other fishes. Excellent food fish.

2. Killy-fish. Southern States and Central America. Smallest of pike-family. In swamps and brooks. Bring forth their young alive.

COLLECTION 856.

Fishes: Trout, Salmon and Shad.

1. Black-spotted Trout. Mississippi Valley and Western States. In rivers and lakes well stocked with smaller fishes, on which it feeds. Excellent game fish.

2. Silver Salmon. Northwestern United States and Alaska. Lives in sea water. In spring and summer it enters the large rivers and proceeds upwards for hundreds of miles to deposit eggs. Excellent food fish.

3. Scales of Tarpon, the largest of the salmon family.

4. Quinnat. Pacific coast from California to Alaska. Most valuable of salmon.

5. Humpbacked Salmon. A species of the Northern Pacific, found as far South as Oregon.

6. Common Shad. Along all the Atlantic coast, but most common from the Hudson to the Potomac. Invades rivers for the purpose of spawning. Next to cod and salmon the most important food fish.

COLLECTION 857.

Fishes: Herring Family.

1. Common Herring. Both shores of the North Atlantic. Found in immense schools. One of the most valuable food fishes.

2. Anchovy. Coasts of most temperate and torrid regions. Swim in large schools. Salted and pickled they furnish excellent food. Also used as bait.

3. Menhaden. Atlantic coast of United States. Very abundant. Yield menhaden oil. Used as bait. Young fishes canned in oil are sold as "American sardines."

COLLECTION 858.

Fishes: Flying Fishes.

1. Common Flying Fish. All tropical seas. Pectoral fins much enlarged acting as wings by means of which the fish may sail through the air. Lives in open seas, swimming in large schools.

2. Half-beak. Tropical and subtropical seas. Spear-like prolongation of lower jaw. Pectorals quite long. Associate in large schools.

COLLECTION 859.

Fishes: Chub and Sucker.

1. Columbia Chub. Rivers of Western and Pacific States. Largest of American chubs. In shape resembles pike. Helps to check the increase of predatory fishes by devouring their eggs.

2. Sucker. All streams of United States east of Rocky Mountains. Feeds on small aquatic animals, sucking food from mud at bottom of streams. Of inferior value as food fish.

COLLECTION 860.

Fishes: Stickle-back.

Stickle-back. Waters of Northern Hemisphere. In blackish water near the coast. Male builds nest of stems and other vegetable matter, tying material by means of secretion from gland on its abdomen.

COLLECTION 861.

Fishes: Solid-Jaw and Foot-Fishes.

1. Trigger-fish. Tropical and subtropical waters. Strong jaws and teeth. Feeds on small mollusks. Flesh eaten in tropical regions. Skin used by carpenters in place of sand paper.

2. Trunk-fish. Atlantic and Pacific coast of United States. Shape like triangular box. Used as food in the West Indies.

3. Porcupine-fish. Tropical waters. Can expand itself to about twice its normal size. Back covered with strong bony spines.

4. Bat-fish. Coasts of tropical Eastern America. Forehead produced into an elongated kind of snout. Assumes an almost toad-like attitude on the ground.

5. Puffer or Balloon Fish. Atlantic Coast. Capable of extraordinary distension so that when inflated the fish appears like a globe.

COLLECTION 862.

Fishes: Cod Family.

1. Common Cod. Waters of Northern Hemisphere. Lives in moderate depth of ocean, but sometimes enters rivers. Most voracious of ordinary fishes. Feeds on almost anything that is eatable in the ocean. Most valuable of food fishes.

2. Pollock. Atlantic coast of United States. Food and habits much like those of cod fish.

COLLECTION 863.

Fishes: Flat Fishes.

1. Flounder. Waters of Northern Hemisphere. Lies on bottom of ocean, flat on light side. Protective coloration, the back showing the color of the ground. Excellent food fish.

COLLECTION 864.

Fishes: Eels.

1. Common Eel. Found in fresh and salt water in all streams of Eastern and Western Atlantic slope having direct communication with ocean. Young eels ascend the streams in immense numbers. Very voracious. Feeds on smaller fishes of all kinds. Important as food fish.

2. Conger-eel. Temperate regions of Atlantic ocean. Larger than common eel. Does not ascend rivers. Common market fish in England.

COLLECTION 865.

Fishes: Pipe-Fish and Sea-Horse.

1. Pipe-fish. Almost all seas. Long, slender body of jointed bone. Male has pouch in which young are hatched. Lives among eelgrass near coast, feeding on minute crustaceans. Swims in half-vertical position.

2. Sea-horse. Almost all seas. Swims in perpendicular position. When resting, holds itself by grasping any object with its prehensile tail. Carries young in pouch.

3. Needle Fish. One of several different gar-fishes or bill-fishes—any belonid; so-called from the sharp slender snout.

4. Sting-ray Fish. A batoid, having a long, smooth, flexible, lash-like tail armed near the base with a bony spine several inches long, sharp at the point, and serrated along the sides. Capable of inflicting severe and painful wounds that seem to be poisoned by the slime with which the sting is covered.

COLLECTION 866.

Fishes: Ganoids or Armored Fishes.

1. Sturgeon. Waters of North Temperate zone. Covered with five rows of bony plates. Mouth underneath head to enable fish to take food off the bottom of the water. Ascends rivers for the purpose of spawning. This specimen was caught in the Meramec river. Fine food fish. From the eggs caviar is prepared.

2. Dog-fish or Bow-fin. Lakes and rivers of Eastern United States. Air bladder divided into cells and functions as a lung. Voracious, consuming large numbers of smaller aquatic animals. Flesh of no value.

3. Long-nosed Gar-pike. Widely distributed in lakes and rivers of the United States. Covered with hard scales laid on in oblique series. Air-bladder like that of dog-fish. Flesh unfit for food.

COLLECTION 867.

Fishes: Sharks and Skates.

1. Mackerel Shark or Porbeagle. Atlantic coast of North America. Very rapacious. Feeds on fishes, crustaceans and mollusks. Oil from the livers used as substitute for cod-liver oil.

2. Jaw of Blue Shark.

3. Egg of Shark.

4. Saw-fish. Southern Atlantic coasts and Gulf of Mexico. Snout prolonged into a very long flat blade with strong enameled teeth on either side. Attacks all larger inhabitants of the sea, especially the whale.

5. Saw of Saw-fish.
6. Thornback Skate or Stingy Ray. Nearly all seas. Lies flat on sandy bottom, feeding on crabs and shell-fish. Tail whip-like armed with saw-teeth, a very dangerous weapon.
7. Jaw of man-eating Shark.

COLLECTION 868.

Fish Products.

Isinglass. Cleaned and dried swimming bladders of sturgeons and other fishes. Used in confectionery and in clarifying wines and beer.

PICTORIAL ILLUSTRATIONS OF FISHES.

Framed Colored Plates Showing Fishes Found in the Waters of the United States.

Size, 10x12 Inches.

COLLECTION 869.

Colored Charts.

1. White Perch.
2. Yellow or Barred Perch.
3. Pike Perch.
4. White Bass.
5. Sea Bass.
6. Striped Bass.
7. Small-mouthed Black Bass.
8. Large-mouthed Black Bass.

COLLECTION 870.

Colored Charts.

1. Scup Porgy.
2. Bull Head.
3. Weak Fish.
4. Common Mackerel.
5. Spanish Mackerel.
6. Bonito.

COLLECTION 871.

Colored Charts.

1. Tomcod or Frogfish.
2. Bluefish.
3. Brook Sucker.
4. Eel.
5. Butterfish.

COLLECTION 872.

Colored Charts.

1. Sheepshead.
2. Shad.
3. Hickory Shad.
4. Alewife or Branch Herring.
5. Pike Pickerel.
6. Banded Pickerel.
7. Atlantic Salmon.

8 and 9. Landlocked Salmon. (Male and Female.)

COLLECTION 873.

Colored Charts.

1. Lake Trout.

2 and 3. Brook Trout (male and female).

4. Rocky Mountain Trout.
5. Rainbow Trout.
6. Steelhead or Salmon Trout.

7 and 8. Canadian Red Trout (male and female).

9. Brown Trout.
10. Sunapee Trout.
11. Smelt.

COLLECTION 874.

Colored Charts.

1. Whitefish.
2. Round Whitefish.
3. Creek Chub.
4. River Chub.
5. Red-sided Minnow.
6. Red-nosed Minnow.
7. Blunt-nosed Minnow.
8. Silverside (male and female).
9. Roach.

COLLECTION 875.

Colored Charts.

1. Bream.
2. Mummichock.
3. Sunfish.
4. Long-eared Sunfish.
5. Tautog.
6. Cisco.
7. Bergall.
8. Fallfish.
9. Black-nosed Dace.
10. Common White Sucker.

Large Colored Charts Illustrating Sea Life.

COLLECTIONS.

876. Snail.
877. Sawfish.

To the Teacher:—

Use this blank page to insert additional collections 878 to 900, to be given in future Supplementary Catalogues.

Page 67.

Large Colored Charts Illustrating Sea Life.

867-a. Man-eating Shark.
878. Fresh-water Fish. (6 Specimens).
879. Whalebone Whale.
880. Sea Fish. (6 Specimens).

MOUNTED MAMMALS.

REFERENCE BOOKS.

Hornaday—American Natural History.
Holtz—Nature Study.
Linville-Kelley—Text-book in General Zoology.
Parker-Haswell—Zoology.
Stone-Cram—Animals.

Mammals: Bats.

COLLECTIONS.

900. Little Brown Bat. North America east of Rocky Mountains. Insectivorous. Congregate about dwellings, old buildings and hollow trees. Nocturnal, resting during the day by means of hanging head down by hind limbs. Hibernating.

901. Silver-haired Bat. Most common species in northern part of the United States. Passes the day in hollow trees. Food and habits like those of the Brown Bat.

902. Long-eared Bat. One of several bats, whose ears are notably long or large, especially plecotus auritus, a common European species.

903. Philippine Bat. An unusually large bat, native of the Philippine Islands.

Mammals: Insectivorous Animals.

COLLECTIONS.

904. Common Shrew. Northern United States. Puts proboscis-like nose into crevices of bark of hollow trees for insects. Favorite haunts underneath wood piles and logs. Prefers neighborhood of streams

905. Common Mole. Common throughout United States. Burrows near surface of ground for insects and worms. Destructive to roots or garden and field plants. Form and parts of body particularly well adapted to mode of life.

906. Garden Mole. An insectivorous mammal of which there are several species. Much alike in general appearance and habits, all living under ground where they burrow with wonderful facility and construct galleries often of great extent. They have small or rudimentary eyes and ears, sharp snout, no visible neck, strong and highly fossorial fore feet and short tail. They feed chiefly on earth worms.

907. Hedgehog. United States and throughout Europe. Woods and hedgerows, living in burrows in winter. Nocturnal. When attacked rolls itself into a ball. Bristles inflict painful wound.

Mammals: Carnivorous Animals.

COLLECTIONS.

908. Domestic Cat.

909. Wild Cat. Formerly everywhere in the United States, but disappearing before civilization. Lives in hollow trees and caverns among the rocks and ledges. Destructive, eagerly hunted by farmers. Ferocious and untamable. Fur valued.

910. Coyote. Northern Mississippi Valley to Rocky Mountains. Lives in burrows on the plains. Feeds on rabbits, ground squirrels and mice. Hunts in packs at night.

911. Red Fox. North America and Europe. Lives in burrows in the ground. Preys on birds and smaller animals. Very cunning and cautious.

912. Raccoon. Northern United States to Rocky Mountains. Lives near the water, along the borders of swamps and brooksides. Omnivorous; eats anything, animal or vegetable. Dips food in water before eating.

913. Badger. Western North America. Lives in burrows of its own digging. Feeds on smaller prairie mammals, also on insects and snakes. Rarely leaves its den in winter.

914. Marten. United States and Europe. Expert climber. Nocturnal. Very voracious. Feeds on eggs, birds, and small quadrupeds. Ruinous visitor to farm yards. Fur valuable.

915. Ferret. Europe. Feeds on small reptiles and quadrupeds, eggs, and birds. Sometimes domesticated and used for rabbit-hunting. Fur valued.

916. Black-footed Ferret. Western North America. Food and habits like those of European ferret.

917. Mink. Northern parts of North America, along streams, especially near woods. Feeds on fish, small reptiles, quadrupeds, and birds. Fur very valuable when taken in winter.

918. Weasel. Various species in all parts of United States. Very preda-

ceous. Often kills for the mere joy of killing. Feeds on all kinds of small quadrupeds and birds, but in summer often lives on grasshoppers and beetles. House under stumps and in the hollow roots of old trees.

919. Skunk. United States and Canada. Odor, means of defense, very strong and offensive. Feeds on eggs, birds, small quadrupeds, and chiefly on insects. Hibernates in burrows.

920. Ermine. (Winter and Summer Fur.) Northern regions of America and Europe. Destructive to small quadrupeds and birds. Fond of eggs. Color of fur brown in winter and white in summer.

Mammals: Gnawing Animals.

COLLECTIONS.

921. Jack Rabbit. Western United States and Canada. Largest of the rabbit family. Home beneath a clump or bush in the prairie. Feeds on vegetables, grass, and weeds. Flesh excellent.

922. Cottontail Rabbit. Common in the United States. Digs its burrow in fields, groves, and meadows. Feeds on fruit, vegetables, grass, and weeds. Destructive to young trees by gnawing their bark. Flesh very good.

923. Guinea Pig. Domesticated. Wild in the woods of Brazil and Paraguay, where it is called Aperea.

924. Red Squirrel. Northern United States and Canada. Quarrelsome, noisy and mischievous. Feeds on nuts, seeds of pine cones, corn, and vegetables.

925. Western Fox Squirrel. Western United States. Largest of the squirrel family. Feeds on wild fruit, berries, pine cones, and corn. Less provident in preparing for the cold season.

926. Gray Squirrel. United States. In hollow branches or trunk of trees. Feeds on fruits, nuts, seeds, and vegetables. Lays in store for winter.

927. Flying Squirrel. A squirrel or squirrel-like animal having a fold of skin like a parachute along each side of the body by means of which it is enabled to make long flying leaps through the air.

928. Ground Squirrel or Striped Gopher. Western United States and Canada. Lives in burrows on the prairies. Feeds on nuts and grain, of which large supplies are put away for the winter months. Uses cheek pouches to carry off food.

929. Franklin Spermophile or Gray Gopher. Western United States and Canada. Burrows among thickets in sandy soil. Food and habits like those of gray gopher.

930. Pocket Gopher. Mississippi Valley. Burrows in the ground. Lives in communities. Nocturnal. Large cheek pouches opening outside of the mouth. Feeds on roots and vegetables.

931. Western Chipmunk. Western region of United States. Among the rocks of the western mountains. Digs burrows in ground, in which it hibernates. Feeds on seeds, grain, berries, grasshoppers and sometimes robs birds' nests of their eggs.

932. Meadow Mouse or Prairie Vole. Upper Mississippi Valley. Inhabits old ant hills or burrows of its own digging in the prairies. Feeds on nuts, acorns and grain. Does great damage by gnawing at stalks of corn.

933. Muskrat. Northern and Central United States and Canada. Lives in shallow water, ponds, and river banks, using its vertically flattened tail for sculling. In fall constructs houses of rushes and mud. Feeds on roots, young shoots, and fresh-water mussels.

934. White-footed Deer Mouse. Central United States, east of Rocky Mountains. Most beautiful of mice. In woods. Makes home in hollow roots and branches of trees. Lays up store of nuts, grain, and seeds for winter.

935. Common House Mouse. Known everywhere.

936. Brown Rat. A rodent of some of the larger species of the genus mus.

937. Prairie Dog. Western United States. Lives in colonies in burrows on the prairies. Feeds on grasses and roots.

938. Groung Hog or Woodchuck. North America. Burrows in woods, prairies, and meadows. Feeds on roots and vegetables; especially fond of red clover. Hibernates. Peculiar superstition regarding its appearance on 2nd of February.

939. Porcupine. Southern Europe. Natural armor of defense formed of sharp stiff bristles which may grow to the length of a foot. Nocturnal. Hibernates in burrows.

Illustrations of Mammals: Gnawing Animals. Large Colored Charts.

COLLECTIONS.

940. Rabbit.
941. Flying Squirrel.

COLLECTION 942.

Mammals: Pouched Animals.

Opossum. Only pouched animal of United States. Lives in trees, eating fruits, eggs, and other small animals. Feigns death, when attacked. Long hairless prehensile tail. Hair used in making felt hats.

PREPARED BODIES OF ANIMALS SHOWING BLOOD CIRCULATION AND NERVOUS SYSTEM.

(In Alcohol.)

For Teachers College and High Schools.

COLLECTION 943.

Domestic Cat.

COLLECTION 944.

Squirrel.

COLLECTION 945.

Pigeon.

COLLECTION 946.

Pike.

COLLECTION 947.

Frog.

ILLUSTRATIONS OF ANIMALS.

LARGE COLORED CHARTS.

COLLECTIONS.

948. Orang-Outang.
949. Gorilla.
950. Wolf.
951. Hyena.
952. Beaver.
953. Elephant.
954. Deer.
955. Reindeer.
956. Buffalo.
957. Llama.
958. Sheep.
959. Dromedary.
960. Giraffe.
961. Polar Bear.
962. Lion and Lioness.
963. Kangaroo.
964. Seal.
965. Duckbill.
966. Wild Hog.

Following Large Colored Charts have been previously listed in Catalogue under numbers given here.

COLLECTIONS.

488. Ostrich.
489. Pelican.
490. Swan.
491. Turkey.
492. Stork.
493. Owl.
494. Ring-necked Pheasant.
495. Crow.
496. Woodpecker.
497. Rooster.
498. Rooster, Hen and Chicks.
757. Crocodile.
758. Lizard.
759. Snake and Frog.
876. Snail.
877. Sawfish.
940. Rabbit.
941. Flying Squirrel.

SMALL GLASS COVERED CHARTS.

Mammals.

COLLECTIONS.

967. Virginia Deer.
968. Adirondack Deer.
969. Moose.
970. Elk.

COLLECTION 971.

Illustrations of Animals.

Mounted colored post cards—Pictures of Animal Life.

To the Teacher:—

Use this blank page to insert additional collections 972 to 1000, to be given in future Supplementary Catalogues.

Large Colored Charts Illustrating Mammals.

961-a. Brown Bear.
964-a. Walrus.
966-a. Hippopotamus.

MINERALS.

REFERENCE BOOKS.

Clapp—Thirty-six Observation Lessons on Common Minerals.

Crosby—Common Minerals and Rocks.

Dana—The Geological Story.

Dana—Minerals and How to Study Them.

Heilprin—The Earth and Its Story.

Patton—The Teacher's Aid.

Parker—Man and Materials.

Richards—First Lessons on Minerals.

Toothaker—Commercial Raw Materials.

COLLECTION **1000.**

Iron.

Most useful and most widely spread of all metals.

1. Hematite. Crystalline, massive or earthy. The earthy variety is red ochre, used for making paint. 76 per cent. of iron ore used in the United States is hematite.

2. Limonite. Brownish or yellowish. Yellow variety is earthy, called yellow ochre. Bog iron is limonite found in swamps. 9 per cent. of the iron ore mined in the United States is limonite.

3. Magnetite. Black, crystalline or massive. Magnetic. 5 per cent. of iron ore in the United States is magnetite.

4. Siderite. Carbonate of iron. In the early stages of iron manufacture it was the most important ore in the United States. Now it constitutes about 10 per cent. of the iron ore mined.

5. Pyrite. Iron sulphide. Massive or in cubical crystals. Widely distributed. Often mistaken for gold and called "Fool's Gold."

6. Calcite with Hematite.

7. Red Ochre.

8. Yellow Ochre.

COLLECTION **1001.**

Iron.

Two Glass Cases showing Iron and its various products.

Illustrations of Iron Industry.

COLLECTIONS.

1002. Various Stereoscopic views illustrating iron industry.

1003. Iron Industry. Fifteen copies of one stereoscopic view. "Steam Shovel Loading Cars."

1004. Iron Industry. Fifteen copies of one stereoscopic view: "Ladle Emptying Molten Metal into Moulds."

COLLECTION **1005.**

Copper.

Next to gold and silver in malleability and ductility; next to iron and steel in tenacity. Native copper occurs in beds and veins. Lake Superior region has the largest native copper beds in the world.

1. Chalco-pyrite. Sulphide of copper and iron, sometimes bearing gold and silver.

2. Bornite. Sulphide of copper and iron. Massive. Structure granular or compact. Color red or brown.

3. Chalcocite. Sulphide of copper. Softest of the common copper ores. Color lead-gray, often blue or green.

4. Malachite. Carbonate of copper. Massive. Color bright green.

5. Azurite Carbonate of copper. Color various shades of azure blue.

6. Ore containing copper, iron, quartz and talc.

COLLECTION **1006.**

Illustrations of Copper Industry.

Stereoscopic views representing Copper Industry.

COLLECTION **1007.**

Zinc and Lead.

Most of the zinc and lead used in our country is found in Missouri, Kansas and Illinois.

1. Sphalerite, Zinc Blende or Black Jack. Sulphide of zinc, often containing iron and manganese. Massive or in crystals. Lustre resinous.

2. Smithsonite. Carbonate of zinc. Lustre glassy to pearly. Color varies from white to brown.

3. Franklinite. Oxide of zinc, iron and manganese. Color iron black. Slightly magnetic.

4. Galena or Lead Ore. Heavy, soft and malleable. Contains more or less silver.

5. Cerussite. Carbonate of lead. Usually massive. Color white to gray.

6. Calcite with sphalerite.
7. Calcite with lead.
8. Silver-lead ore.

COLLECTION **1008.**

Gold and Silver.

1. Gold ore.
2. Gravel containing gold.

Gold occurs free in veins or in gravels. In the latter case it is called alluvial gold, occurring in flakes or as nuggets, due to rolling. South Africa, Colorado and Alaska are the most important gold-producing regions.

3. Sylvanite. Colorado. Contains both gold and silver.

4. Silver. Mostly found with gold and like it in masses, threads or leaves in rocks. Principal silver producing countries are United States and Mexico.

5. Argentite. Sulphide of silver. Found in Nevada, Arizona and the Lake Superior region.

6. Gold and Antimony. New South-Wales. For antimony see collection 1062.

7. Argentiferous Quartz.

COLLECTION **1009.**

Illustrations of Gold and Silver Industry.

Stereoscopic views showing gold and silver mining.

COLLECTION **1010.**

Illustrations of Mining.

Stereoscopic views showing various phases of mining of metallic ores.

COLLECTION **1011.**

Mining.

Ore Samples and commercial products from North American Mines, Fredericktown, Missouri.

COLLECTION **1012.**

Quartz.

Quartz or Silica occurs massive or in crystals. Hardest common mineral, scratching glass easily. Insoluble in water and the common acids. 25 per cent of the crust of the earth is quartz. Used in glass and pottery-making and for sandpaper.

1. Massive Quartz.

2. Quartz Crystal. Beautiful specimens are found in Hot Springs, Ark.

Some quartz is milky in appearance. The presence of various elements forms the following varieties, some of which are used as ornamental stones:

3. Amethyst.
4. Rose Quartz.
5. Opal.
6. Chalcedony.
7. Agate.
8. Smoky Topaz.
9. Jasper.
10. Flint. Produces fire when struck with steel. Used for knives and arrow points in early times.
11. Fragments of Quartz Geodes. Compact crystallizations of quartz.
12. Onyx.
13. Heliotrope or Bloodstone.

COLLECTION **1013.**

Silicified Woods.

Woods in which the woody matter has given way to quartz molecules The structure of the wood remains.

1-6. Various specimens of silicified woods, polished and unpolished.

COLLECTION **1014.**

Illustrations of Silicified Woods.

Stereoscopic views representing silicified woods and regions where they are found.

COLLECTION **1015.**

Granite.

Consists of quartz, feldspar and mica. Widely distributed. Forms the core of many mountain ranges. Used in building, paving, and for monuments.

1-3. Various specimens of granite.

4. Syenite Granite. Contains quartz, feldspar and hornblende.

COLLECTION **1016.**

Illustrations of Granite Industry.

Stereoscopic views representing granite, granite quarries, etc.

COLLECTION **1017.**

Minerals of Which Granite is Formed.

1. Feldspar. Widely distributed. Easily split into blocks or plates. Color

white or flesh-red. Used in the manufacture of pottery and tiles.

2. Mica. Often wrongly called isinglass. World-wide. Easily split into thin leaves. Used for stove doors and lamp chimneys.

3. Quartz. See collection 1012.

COLLECTION **1018.**

Limestone.

Most common of the sedimentary rocks. Large beds found in the Central States. Formed from calcareous skeletons of invertebrates or by precipitation of carbonate of lime from fresh or salt water solution. Used as building stone.

1. Fossil Invertebrates, from which limestone is formed.

2-3. Black and White Limestone.

4. Hydraulic Limestone. Yields cement.

5. Calcite. Crystalline limestone.

6. Dog-tooth Spar. Variety of calcite.

7. Rhomb Spar. Variety of calcite.

8. Iceland Spar. Variety of calcite.

9. Aragonite. Finest of crystalline limestone.

COLLECTION **1019.**

Other Limestone Formations.

1-2. Stalagmite and Stalactite. Cave formations, calcium carbonate being deposited from dripping or standing water.

4-7. Varieties of Marble. Marble is limestone subjected to heat and pressure in the presence of moisture. Used in building and in sculpture.

8. Dolomite. Carbonate of calcium and magnesium. Sometimes called magnesian limestone. Durable building stone.

9. Polished specimens of stalagmite and stalactite.

10. Calcareous Tufa. Variety of calcite. Deposited around the mouths of springs and along the beds of streams which these springs form, enveloping stones, roots, grasses, etc.

11. Chalk. Kansas. Occurs abundantly in great strata. Easily broken and pulverized. Used to make lime for polishing metal and glass, as marking material, and for writing in the shape of crayon.

COLLECTION **1020.**

Limestone: Domestic Marble.

1. Black Marble. Vermont.
2. Extra Dark Marble. Vermont.
3. Verde Antique Marble. Vermont
4. Royal Blue Marble. Vermont.
5. Ebony Marble. Vermont.
6. Mahogany Marble. Vermont.
7. Italian Marble. Vermont.
8. Oriental Marble. Vermont.
9. White Marble. Vermont. Showing various stages of development.

COLLECTION **1021.**

Illustrations of Marble Quarrying, Vermont.

Fifteen copies of one stereoscopic view—"Marble Quarry of Vermont."

COLLECTION **1022.**

Illustrations of Marble Quarrying.

Photographs of Marble Quarry in Vermont.

COLLECTION **1023.**

Limestone: Domestic Marble.

1. Varieties of Tennessee Marble.
2. Varieties of Georgia Marble.

COLLECTION **1024.**

Limestone: Foreign Marble.

1. Statuary Marble. Italy.
2. Porphyritic Marble. Italy.
3. Stalagmite Marble. Gibraltar.
4. Rosewood Marble. England.
5. Serpentine Marble. Ireland.
6. Pollino Marble. Saxony.

COLLECTION **1025.**

Limestone.

1-2. Glass cases showing various forms of limestone.

COLLECTION **1026.**

Illustrations of Limestone Formations.

Various stereoscopic views showing limestone formations.

COLLECTION **1027.**

Sandstone and Slate.

Sedimentary formation consisting of

small quartz grains held together by lime or some other cementing material. Common colors white, gray, brown, and red. Used for building and ornamental work, for paving and making millstones and grindstones.

1-4. Varieties of Sandstone.

Slate is a fine-grained deep-water formation. Cleavage due to pressure and folding of rocks. Color generally gray, passing into shades of blue, green and red. Used for roofs, blackboards and school slates and ground up as a pigment for paint.

5-6. Red and Black Slate.

COLLECTION 1028.

Gneiss and Schist.

Like granite, composed of feldspar, mica and quartz, but arrangement is in parallel planes. Can easily be split into layers.

1. Gneiss.

Schist has the same constituents as granite and gneiss, mica predominating. Of little economic value.

2. Mica Schist.
3. Chlorite Schist.
4. Hornblende Schist.
5. Garnet in Schist.

COLLECTION 1029.

Lava.

Hard, tough, and dark-colored rock formed of masses issued by eruptions from volcanoes. Article used by jewelers as lava is a cement of volcanic ash and water. The material which covers Pompeii is largely of this nature. Diabase is underground lava.

All lavas are finely crystalline, due to rapid cooling.

1. Obsidian or Volcanic Glass.
2. Volcanic Ash.
3. Basalt.
4. Anorthite, Mt. Vesuvius.
5. Pumice. Used as polishing material.
6. Dendritic Lava. So called from tree-like formations on surface.
7. Manharite.

COLLECTION 1030.

Coarsely Crystalline Igneous Rocks.

Found underground. Crystals are coarse because of slow cooling.

1. Pyroxene.
2. Diabase.
3. Sahlite. The Tyrol.
4. Diorite.

Illustrations of Volcanoes.

COLLECTIONS.

1031. Various stereoscopic views illustrating volcanic action.

1032. Volcanic Action—Fifteen copies of one stereoscopic view "Mallibon, Strange River of Fire—St. Vincent, B. W. I."

1033. Volcanic Action—Fifteen copies of one stereoscopic view "Mammoth Crater—St. Vincent, B. W. I."

1034. Volcanic Action—Fifteen copies of one stereoscopic view "Crumbling Ash Deposits—St. Vincent, B. W. I."

COLLECTION 1035.

Coal.

Coal is the result of the gradual change which has taken place during past ages in organic deposits, chiefly vegetable. Thus it passed from forms such as peat and lignite, which still retain the structure of the vegetable matter, to soft or bituminous coal and further to hard or anthracite coal and to graphite.

1. Peat.
2. Lignite.
3. Soft Coal.
4. Hard Coal.
5. Graphite. See collection 1045.
6. Gilsonite or Asphalt. Utah. Mineral substance formed by the decomposition of organic matter. Found in a pure state and mixed with clay, shale, sandstone, and limestone. Used as paving material and for the making of cement and varnish.

Illustrations of Coal Mining.

COLLECTIONS.

1036. Various stereoscopic views illustrating peat regions and coal mining.

1037. Coal Industry—Fifteen copies of one stereoscopic view "Cutting Peat in the Allen Bogs—Ireland."

1038. Coal Industry—Fifteen copies of one stereoscopic view "Miners Entering Shaft."

1039. Coal Industry—Fifteen copies of one stereoscopic view "Digging into the Hillside—Pennsylvania."

COLLECTION **1040.**

Coal.

Three glass cases showing Coal in its various stages of development.

COLLECTION **1041.**

Illustrations of Peat Industry.

Chart showing the cutting of Peat.

Miscellaneous Minerals.

COLLECTIONS.

1042. Cinnabar. Sulphide of mercury. Ore from which mercury is obtained. Color generally cochineal red. Principal mines in our country in California, Nevada and Utah.

1043. Bauxite. The only ore from which aluminum is obtained. Ore mined in Arkansas, Alabama and Georgia, and in France and Ireland.

1044. Sulphur. Found abundantly in the neighborhood of volcanoes. Principal mines in Southern Italy and Sicily. Used in the manufacture of gunpowder, matches, and as a disinfectant.

1045. Graphite or Plumbago. Characteristics: extreme softness, iron black color and metallic lustre. Principal mines in East Siberia, Ceylon and Bohemia. Used for making lead pencils, stove blacking, paint and lubricants.

1046. Asbestos. Fibrous mineral. Incombustible. Owing to its fibrous texture. It can be woven into cloth used for theater curtains and coverings for boilers and steam pipes. Principal mines near Quebec, Canada.

1047. Rock Salt. Occurs in beds of rock masses and is mined in lumps like ore or coal. Principal mine in Wieliczka, Austria. In the United States salt mines are found in New York, Louisiana, Texas, Michigan and Utah.

1048. Phosphate Rock. Southern States, Canada and Central Europe. Used in the preparation of fertilizers. Also yields the phosphorus for the manufacture of matches.

COLLECTION **1049.**

Illustrations of Salt Mining.

Stereoscopic views illustrating Salt Mining.

COLLECTION **1050.**

Gypsum.

Occurs in extensive beds in central portion of United States west of the Mississippi. Does not effervesce with acids like calcite. Soft.

1. Massive Gypsum. Color usually white, sometimes, red, gray, yellow or blue. The fine grained variety is called alabaster, from which fine vases are made.

2. Red Gypsum.

3. Selenite. Crystallized Gypsum. Colorless and transparent. Splits into thin, brittle leaves.

4. Satin Spar. Fibrous gypsum abundant in Mammoth Cave, Ky., and in the Garden of the Gods, Colorado.

COLLECTION **1051.**

Illustrations of Ruby Mining.

Stereoscopic views, illustrating Ruby Mining.

Miscellaneous Minerals.

COLLECTIONS.

1052. Corundum. Oxide of aluminum. Next to diamond in hardness. Under the term "emery" it is used as an abrasive. Ruby and Sapphire are forms of crystallized corundum.

1053. Beryl. One of the very hard minerals. Color emerald green to light-blue. The emerald is a green variety of beryl.

1054. Strontianite. Carbonate of strontium. Gives intense red flame when treated with hydrochloric acid.

1055. Celestite. Sulphate of strontium. Often associated with limestone. May be recognized by its insolubility in acids and by the red flame occurring after treating the fused specimen with alcohol or hydrochloric acid.

1056. Talc. Very soft. Can be indented with finger nail. Feels greasy. Two varieties: (a) foliated, easily separated into leaves; (b) massive, known as steatite, from which a certain kind of crayon and pencil is made.

1057. Soapstone. Impure variety of talc.

1058. Tourmaline. Black mineral in some granite rocks. Resembles hornblende, but is harder and more brilliant. Red and green varieties are used as gems. Crystals, when rubbed or heated, become electric and attract hairs and fibers.

Miscellaneous Ores.

COLLECTION **1059.**

Arsenic Ores.

Arsenic Ore. From it is obtained the arsenic of commerce. Employed in the preparation of dyes, in the making of glass, and as a poison to destroy vermin.

1. Orpiment. Species of arsenic ore. Color lemon yellow. Softer than calcite.

2. Realgar. Species of arsenic ore. Color morning red to orange. On charcoal burns with blue flame. Often associated with orpiment.

COLLECTION **1060.**

Manganese Ores.

Manganese. Three species. Found mostly in Russia. Used in the production of steel and manufacture of bleaching agents.

1. Philomelane. Color iron black to dark steel gray. Common but impure ore of manganese.

2. Pyrolusite. Oxide of manganese. Color iron black. Much softer than philomelane.

3. Dendrite. So-called from the peculiar tree-like forms found in certain manganese ores.

Miscellaneous Ores.

COLLECTIONS.

1061. Chrome. Chromite. Oxide of iron and chromium. Color black, streak brown. Sometimes feebly magnetic.

1062. Antimony. Stibnite, Also called antimony glance. Fine metallic lustre. Color lead gray. Easily fusible. Little harder than graphite.

1063. Tin. Cassiterite. High specific gravity. Hardness almost that of quartz. Stream tin (specimen in bottle) the ore in state of sand. Occurs in small quantities in Virginia, Maine, California, and Montana.

COLLECTION **1064.**

Aluminum.

1. Bauxite. Ore from which aluminum is obtained.

2. Alumina. Bauxite is shipped to purifying plants where the impurities are removed, leaving the pure oxide of aluminum, or alumina, in the shape of a white powder.

3. Ingot of Aluminum. Through removing the oxygen by electrical energy the alumina is reduced to aluminum which is then run into moulds similar to the small ingot in this collection.

4. Aluminum Wire.

5. Aluminum Sheeting.

6. Aluminum Tubing.

7. Aluminum Castings.

COLLECTION **1065.**

Talc.

1. Talc or Soapstone. See collections 1056 and 1057.

2. Talc Pencils formerly used for writing.

3. Talc cut into various forms.

COLLECTION **1066.**

Carborundum.

Carborundum is a manufactured material. Coke crushed and ground to a fine powder is mixed with glass sand, and salt and sawdust added. This mixture is placed in an electric furnace through which for 36 hours an electric current of one thousand horse power is passed producing a heat of 7000° Fahr. When the furnace is cool the mixture is found converted into beautifully colored crystals.

1. Coke.
2. Sawdust.
3. Sand.
4. Salt.

} Crude materials from which carborundum is made.

5. Crude Carborundum. Next to the diamond the hardest substance.

6. Varieties of Carborundum Crystals, Grains, and Powders. Used in the manufacture of wheels, disks, hones, and carborundum cloth and paper.

7. Carborundum Cloth. Used as an abrasive.

8. Carborundum Paper. Used for the same purposes as sandpaper.

9. Carborundum Wheel. Made of a mixture of clay and carborundum crystals and grains.

10. Scythe Stone. Made of carborundum powder.

11. Slip Stone. Made of carborundum powder.

12. Oil Stone. Made of carborundum powder.

13. Varieties of carborundum disks used for dental work.

COLLECTION **1067.**

Minerals.

Eleven duplicate boxes, containing twelve specimens each, of the World's Fair Collection of Idaho minerals.

1. A Gold-bearing ore.
2. Chalcedony.
3. Amazon Stone.
4. Black Moss Agate.
5. Lithia Mica.
6. Petrified Wood.
7. Precious Opal.
8. Smoky Topaz.
9. Galena.
10. Satin Spar.
11. Lime-soda Feldspar.
12. Rose Quartz.

COLLECTION **1068.**

Minerals.

One box Manhattan collection of minerals. Thirty-six pieces arranged according to Dana's "Minerals and How to Study Them."

COLLECTION **1069.**

Fossil Formations.

1. Fossil Trilobites—Paleozoic, Silurian.
2. Various other fossil formations of the Paleozoic Era.
3. Fossil formations of the Mesozoic Era.
4. Fossil formations of the Tertiary Era.
5. Concretions containing fossils; taken from the coal measures of Mazon Creek, Grundy Co., Ill.

To the Teacher:—

Use this blank page to insert additional collections 1070 to 1100 to be given in future Supplementary Catalogues.

CHARTS ILLUSTRATING PHYSIOLOGY.

Large Colored Charts, Showing Various Organs of the Human Body.

COLLECTIONS.

1100. Thoracic Cavity and Organs of Circulation.
1101. Respiratory Organs.
1102. Alimentary Tract.
1103. Digestive Organs.
1104. Chest, Abdomen and Blood Circulation.
1105. Skeleton of Man.
1105a. Organs of the Senses—Ear and Eye.

COLLECTION **1106.**

Physiology.

One set of twelve lithographic plates showing the formation of teeth and jawbone from Birth to Old Age.

ILLUSTRATIONS OF LANGUAGE LESSONS.

Large Colored Charts for the Illustration of Language Lessons in the Kindergarten and the Primary Grades.

Size, 22x28 Inches.

COLLECTIONS.

1106a. Tannery.
1107. Carpenter Shop.
1108. Blacksmith Shop.
1109. Pottery Shop.
1110. Bakery Shop.
1111. Cooper Shop.
1112. Village and Pond.
1113. Plowing.
1114. Wanderer and Lark.
1115. Horse and Sparrow.
1116. Dancing Bear.
1117. Fox and Duck.
1118. Ducks in Pond.
1119. Pigpen.
1120. Goat and Dog.
1121. Horse.
1122. Cat.
1123. Dog.
1124. Donkey.
1125. Boy and Bird.
1126. Cow and Calf.
1127. Spring.
1128. Summer.
1129. Autumn.
1130. Winter.

The Following Eighteen Charts have been previously listed in Catalogue under numbers as given here.

Illustrations of Language Lessons.

COLLECTIONS.

325. Goose.
497. Rooster.
498. Rooster, Hen and Chicks.
494. Ring-necked Pheasant.
493. Owl.
496. Woodpecker.
495. Crow.
488. Ostrich.
489. Pelican.
490. Swan.
491. Turkey.
492. Stork.
759. Snake and Frog.
876. Snail.
958. Sheep.
941. Flying Squirrel.
954. Deer.
962. Lion and Lioness.

ASTRONOMICAL CHARTS.

COLLECTIONS.

1131. Revolution of the Moon about the Earth.
1132. Movement of the Earth about the Sun.
1133. The Comparative Sizes of the Planets.
1134. Central Sun and View of the Fixed Stars.
1135. Solar System.
1136. The Sun seen through a Telescope
1137. The Moon seen through a Telescope.
1138. The Moon's Phases.
1139. The Tides and Eclipses of Sun and Moon.
1140. Map of the Heavens showing Stars which are visible during the entire year.
1141. Signs of the Zodiac and Change of Seasons.
1142. Atmospheric Phenomena.
1143. Comets and Aerolites.
1144. The Earth and its Atmosphere.

CHARTS SHOWING TYPES OF ARCHITECTURE.

COLLECTIONS.

1145. Egyptian.
1146. Greek.
1147. Roman.
1148. Gothic.

ILLUSTRATIONS OF ANCIENT HISTORY.

Large Colored Charts 22x28 Inches, and Photogravures 12x16 Inches in Size.

COLLECTIONS.

1149. Hekate Group.
1150. Dedication of Greek Temple.
1151. Temple of Neptune.
1152. Lemnian Athena. Phidias.
1153. Olympian Games.
1154. Demosthenes.
1155. Theater of Dionysius in Athens.
1156. A Roman Camp.
1157. Forum Romanum.
1158. Interior of a Roman House.
1159. Roman Lady at Her Toilet.
1160. Vestal Virgins.
1161. Teutonic Life.
1162. Emperor Hadrian.
1163. Emperor Trajan.
1164. Emperor Marcus Aurelius.
1165. Empress Faustina in the Temple at Praeneste.
1166. Death of Commodus.
1167. Emperor Constantine.
1168. Triumphal Arch of Constantine.
1169. Emperor Theodosius and Bishop Ambrose.
1170. Last Combat of the Gladiators.
1171. Chariot Race in Circus at Antioch.
1172. Peristyle in Pompeian Antioch.
1173. House of Poet in Pompeii.
1174. Colossus of Memnon. Large Photographs.
1175. Persepolis.
1176. Pompeii.
1177. Coliseum, Rome.
1178. Pantheon, Rome.
1179. Interior of Greek Theater.
1180. Greek School.
1181. Homer.
1182. Plato.
1183. Sophocles.
1184. Cicero.

ILLUSTRATIONS OF HISTORY OF THE MIDDLE AGES.

Large Colored Charts.

COLLECTIONS.

1185. Tournament.
1186. German Castle.
1187. Interior of a German Town in the 15th Century.

COLLECTION **1187a.**

History of the Middle Ages.

Model of a Catapult. Constructed by a pupil of the Wyman School to illustrate the Reading Lesson: "How They Besieged the Town." (Baldwin's Sixth Reader).

ILLUSTRATIONS—HISTORY.

Mounted Colored Post Cards.

COLLECTIONS.

1188. Pictures of Ancient and Mediaeval life.
1189. Crowned heads of England in costume in their period from William I. 1066 to Queen Victoria 1838.
1190. Soldiery of England from 1066 to 1838.

Articles of Armor: Metal Ware.

COLLECTIONS.

1191. Helmet.
1192. Helmet with Vizor.
1193. Gauntlet.

COLLECTION **1194.**

Stereoscopic Views.

Early United States History. The Spirit of Independence.

PICTORIAL ILLUSTRATIONS OF GEOGRAPHY.

STEREOSCOPIC VIEWS.

From 6 to 12 Views in each Collection, except where 15 copies of one view are indicated.

COLLECTIONS.

1195. Maine.
1196. New Hampshire.
1197. Vermont.
1198. Massachusetts.
1199. Boston, Mass.
1200. New York.
1201. Rochester, N. Y.
1202. Niagara Falls.
1203. Pennsylvania.
1204. New Jersey.
1205. Maryland.
1206. Washington.
1207. Virginia.
1208. West Virginia.
1209. Georgia.
1210. North and South Carolina.
1211. Tennessee.
1212. Florida.
1213. St. Augustine, Fla.
1214. Louisiana and Arkansas.
1215. Texas.
1216. Kentucky.
1217. Mammoth Cave, Ky.
1218. Ohio.
1219. Indiana.
1220. Indianapolis, Ind.
1221. Illinois.
1222. Missouri.
1223. St. Louis—Louisiana Purchase Exposition.
1224. St. Louis—Tower Grove Park.
1225. St. Louis—Reservoir Park.
1226. St. Louis — Various Floral Groups.
1227. Wisconsin and Minnesota.
1228. Colorado, Montana, Idaho.
1229. Yellowstone Park.
1230. Yellowstone—Fifteen copies of one view—"Old Faithful Queen of the Geysers."
1231. Utah.
1232. Oregon.
1233. Washington State.
1234. California.
1235. California—Fifteen copies of one view—"Orange Blossoms and Fruit." (Colored.)
1236. Arizona.
1237. Alaska.
1238. British America.
1239. West Indies.
1240. Martinque—West Indies.
1241. Cuba.
1242. Hawaii.
1243. Mexico.
1244. Central America—Costa Rica.
1245. Central America—Nicaragua.
1246. Central America — Gautemala and Salvador.
1247. Panama.
1248. South America.
1249. Great Britain—England.
1250. London—Fifteen copies of one view—"Street Scene in front of Royal Exchange—London."
1251. England—Fifteen copies of one view—"Ambleside and Wansfell Pike —Lake District—England."
1252. Great Britain—Scotland and Wales.
1253. Great Britain—Ireland.
1254. France.
1255. Paris, France.
1256. Paris—Fifteen copies of one view—"Avenue de L'Opera—Paris."
1257. Germany.
1258. Germany — Fifteen copies of one view—"Harbor at Hamburg—Germany."
1259. Germany — Fifteen copies of one view — "Castle Rheinstein — On Rhine—Germany."
1260. Holland.
1261. Holland—Fifteen copies of one view—"Quaint Street in a Dutch Village."
1262. Holland—Fifteen copies of one view—"Water Street in Zaandam.—Holland."
1262a. Belgium.
1262b. Denmark.
1262c. Norway.
1262d. Sweden.
1263. Switzerland.
1264. Switzerland—Fifteen copies of one view—"A Glimpse of the Matterhorn."
1265. Switzerland—Fifteen copies of one view—"Village of Wengen."
1266. Switzerland—Fifteen copies of one view—"Looking out of the Gorge of the Alpbach."
1267. Spain.
1268. Italy.
1269. Italy—Fifteen copies of one view—"Birds-eye View of Naples and Vesuvius."
1270. Greece.
1271. Russia.

1272. Russia—Fifteen copies of one view—"Wheat for Export—Seaport of Odessa—Russia."
1274. Africa.
1275. South Africa.
1276. Egypt.
1277. Egypt—Fifteen copies of one view—"Colossus of Rameses."
1278. Egypt—Fifteen copies of one view—"Inundation of the Nile."
1279. Syria.
1280. Palestine.
1281. Turkey.
1282. Ceylon.
1283. East Indies.
1284. India.
1285. China.
1286. Korea.
1287. Japan.
1288. Philippine Islands.

ILLUSTRATIONS OF GEOGRAPHY.

LARGE COLORED CHARTS.

COLLECTIONS.

1289. Harbor of New York.
1290. Canyons of the Shoshone River Idaho.
1291. Grand Canyon of the Colorado.
1292. Sierra Nevada.
1293. Polar Landscape.
1293a. Esquimaux.
1294. The Tundra.
1295. Greenland.
1296. Tropical Forest of South America
1297. Mangrove Coast of Venezuela.
1298. The Harbor of Hamburg, Germany.
1299. The Dunes of Helgoland.
1299a. The Dunes of the Isle of Sylt.
1299b. Natural Phenomena Caused by Sand and Wind.
1299c. Thuringen Forest.
1300. A Scene in Berlin.
1300a. Bay of Kiel.
1301. A Scene in Vienna.
1302. A Scene in Amsterdam.
1303. Sluices in Yumidon.
1304. Marshland.
1305. Mountain Scene in Switzerland.
1306. Set of charts, illustrating Schiller's drama, William Tell.
1307. St. Peter's Church, Rome.
1308. Naples—Vesuvius.
1309. Syracuse—Sicily.
1310. Nice Type of Promontory.
1311. The Steppes—Russia.
1311a. Hungarian Steppe.
1312. Norwegian Fjord.
1313. Hammerfest,— Norway.
1314. Sphinx and the Pyramids—Africa.
1315. Street Life in Cairo.
1316. The Sahara Desert.
1317. Cape Town,—Africa.
1317a. German—East African Landscape.
1318. A Chinese Town.
1319. Himalaya Mountains.
1320. Life in Japan.

ILLUSTRATIONS OF GEOGRAPHY.

PHOTOGRAPHS ILLUSTRATING LIFE IN VARIOUS COUNTRIES.

COLLECTIONS.

1321. Great Britain.
1322. Switzerland.
1323. Germany.
1324. France.
1325. Spain and Portugal.
1326. Italy.
1327. Greece.
1328. Egypt.
1329. Holy Land.
1330. India.
1331. Japan.
1332. Philippines.
1333. Bahama Islands.
1334. New Zealand—Okoroire.
1335. Cuba.
1336. Niagara Falls.
1337. California.
1338. Agriculture in California.
1339. Yellowstone and Garden of the Gods.

ILLUSTRATIONS OF GEOGRAPHY.

BOOKLETS.

Booklets containing Pictures and Miscellaneous Information on Various Sections of our Country.

COLLECTION **1339a.**

Booklets.

Thirty copies of Booklet containing

twelve views of California, Oregon and Washington.

COLLECTION **1339b.**

Booklets.

Three copies of Booklet containing pictures and information on the State of Washington.

COLLECTION **1339c.**

Booklets.

Three copies of Booklet containing pictures and information on the State of Montana.

COLLECTION **1339d.**

Booklets.

Five copies of Booklet containing pictures and information on Yellowstone National Park, Lake Tahoe, Yosemite Valley and Mariposa Big Tree Grove.

COLLECTION **1339e.**

Booklets.

Twenty copies of Booklet entitled—"One Hundred Golden Hours at Sea." A "Circle Tour" by Water and Rail from New York to the South, West, North, and back to New York.

COLLECTION **1339f.**

Booklets.

Twenty-five copies of Booklet entitled—"What Every School-boy and School-girl Should Know."—giving many interesting facts of Railroad Development.

COLLECTION **1339g.**

Booklets.

Twenty-five copies of Booklet entitled—"Railroad Signaling,"—especially interesting for the boys.

ILLUSTRATIONS OF PHYSICAL GEOGRAPHY.

LARGE COLORED CHARTS.

COLLECTIONS.

1340. Eruption of Mount Etna.
1340a. Eruptions of Mt. Vesuvius.
1341. Glacial Formations.
1342. Caves Formed by Decomposition.
1343. Lime Formations.
1344. Rock Strata on the Potomac.
1345. Principal Forms of the Earth's Surface.

Previously Listed Charts.

COLLECTIONS.

1290. Canyons and Falls on the Shoshone.
1305. Mountain Scene in Switzerland.
1316. The Sahara Desert.

ILLUSTRATIONS OF PHYSICAL GEOGRAPHY.

STEREOSCOPIC VIEWS.

From 2 to 6 views in each collection, except where 15 copies of one view are indicated.

COLLECTIONS.

1346. Sea Coasts.
1347. Sea Coasts—Fifteen copies of one view—"Rock and Town of Gibraltar."
1348. Erosion.
1349. Erosion—Fifteen copies of one view—"The Sinuous Colorado."
1350. Volcanic Action.
1351. Volcanic Action—Fifteen copies of one view—"Fujiyama's Vast, Mysterious Crater."
1352. Geysers.
1353. Geysers.—Fifteen copies of one view—"Old Faithful Geyser in Action."
1354. Rivers.
1355. Lakes.
1356. Divides—Fifteen copies of one view—"The Continental Divide."
1357. Canyons.
1358. Canyons—Fifteen Copies of one view—"Down the River and Canyon—Yellowstone."
1359. Falls and Cataracts.
1360. Falls—Fifteen copies of one view — "General View of Niagara Falls."
1361. Plains.
1362. Glaciers.
1363. Glaciers—Fifteen copies of

one view—"The Great Glacier of the Selkirks."

1364. Tides.

1365. Deserts.

1366. Deserts—Fifteen copies of one view—"Second Pyramids, Egypt."

ILLUSTRATIONS: GEOGRPHY.

Homes.

REFERENCE BOOK.

Chamberlain—How We Are Sheltered.

STEREOSCOPIC VIEWS.

From 2 to 6 views in each collection.

COLLECTIONS.

1367. Homes of North American Indians.

1368. Homes of Alaska and the Arctic Regions.

1369. Homes of Mexico.

1370. Homes of the West Indies and Panama.

1371. Homes of Hawaii.

1372. Homes of Great Britain.

1373. Homes of Norway.

1374. Homes of Europe.

1375. Homes of Japan, China and Korea.

1376. Homes of the Philippines.

1377. Homes of Asia.

1378. Homes of Africa.

COLLECTION **1379.**

Illustrations: Geography.

Large colored chart illustrating prehistoric homes built on piles.

ILLUSTRATIONS: GEOGRAPHY.

Mounted Colored Post Cards, Illustrating Life in Various Foreign Countries.

COLLECTIONS.

1380. Pictures of Homes and Life in Argentine.

1381. Natives of Europe in Costume.

1382. Natives of Africa in Costume.

1383. Life in New Zealand.

1384. Life in Borneo.

1385. Natives of Asia in Costume.

To the Teacher:—

Use this blank page to insert additional collections 1386 to 1450, to be given in future Supplementary Catalogues.

Large Colored Chart for the Illustration of Language Lessons in the Kindergarten and Primary Grades.

1107-a. Tailor Shop.

Stereoscopio Views.

From 6 to 12 Views in each Collection, except where 15 copies of one view are indicated.

COLLECTIONS.

1247-a. Panama—Fifteen copies of one view "At Work in Culebra Cut near Empire, Panama."

1247-b. Panama.

1248-a. Peru.

1248-b. Ecuador.

1259-a. Austria Hungary.

1262-e. Norway—Fifteen copies of ono view—"Trondhjem Harbor."

1262-f. Norway—Fifteen copies of one view—"Taking Hay down from the Mountains."

1269-a. Sicily.

1270-a. Greece.

1270-b. Constantinople.

1283-a. Burma.

1288-a. Australia.

1288-b. New Zealand.

Large Colored Charts Illustrating Geography.

COLLECTIONS.

1308-a. Venice.

1318-a. Nation Types—Chinese.

A VALUABLE COLLECTION OF 900 EXCELLENT PHOTOGRAPHS, DONATED TO THE EDUCATIONAL MUSEUM BY MR. JAMES W. BELL, WHO HAD GATHERED THEM DURING A TRIP ABROAD.

COLLECTIONS.

1321. British Isles.

1322. Switzerland.

1323. Germany.

1323-a. Austria-Hungary.

1324. France.

1324-a. Holland and Belgium.

1326. Italy.

1327. Greece.

1327-a. Turkey in Europe.

1328. Egypt.

1329-a. Turkey in Asia.

1330. India.

1330-a. Indo-China and Malay Peninsula.

1330-b. China.

1331. Japan.

1331-a. People and Industries of Japan.

Various Booklets

COLLECTION **1339-a2.**

Twenty copies of Booklet—"Big Trees of California."

COLLECTION **1339-e2.**

Twenty copies of Relief Map of Panama Canal Zone and twenty copies of Booklet of Statistics and Views of Panama Canal.

COLLECTION **1339-h.**

Twenty copies of Booklet—"For Better Crops."

Large Colored Charts Illustrating Literature Subjects.

1339-x. Red Riding Hood.

1339-y. Wolf and Seven Kids.

COLLECTIONS ILLUSTRATING LIFE AND OCCUPATIONS OF NORTH AMERICAN INDIANS.

COLLECTION 1450.

Home. North American Indians.

Various articles used about the home, by the North American Indian.

COLLECTION 1451.

Clothing. North American Indians.

Various articles of clothing worn by the North American Indians.

COLLECTION 1452.

War. North American Indians.

Various implements of war used by the North American Indians.

COLLECTION 1453.

Illustrations. North American Indians.

Stereoscopic pictures illustrating life of North American Indians.

COLLECTION 1454.

Samples of Indian Pottery, showing variety of motives in decoration, useful for Seventh Grade Drawing Work.

ARTICLES ILLUSTRATING LIFE IN MEXICO.

COLLECTION 1455.

Mexico: The House.

Articles used about the house by the Mexicans.

COLLECTION 1456.

Mexico: Ancient Modes of Worship.

Various idols worshiped by the Mexicans.

COLLECTION 1457.

Mexico: War.

Implements of war used by the Mexicans.

COLLECTION 1458.

Mexico: Pottery.

Various vases used by the Mexicans.

COLLECTION 1459.

Mexico: Ornaments, etc.

Articles of dress and ornamentation worn by the Mexicans.

COLLECTION 1460.

Illustrations: Mexico.

Photographs illustrating Life and Scenery in Mexico.

COLLECTION 1243. (Previously listed.)

Illustrations: Mexico.

Stereoscopic views illustrating Life in Mexico.

ARTICLES ILLUSTRATING LIFE IN JAPAN.

COLLECTION 1461.

Clothing: Japan.

Various articles of clothing worn by Japanese men, women and children.

COLLECTION 1331. (Previously listed.)

Illustrations: Japan.

Photographs illustrating life in Japan.

COLLECTION 1287. (Previously listed.)

Illustrations: Japan.

Stereoscopic views illustrating life in Japan.

COLLECTIONS OF ARTICLES USED BY THE INHABITANTS OE THE PHILIPPINE ISLANDS.

COLLECTION 1462.

House. Philippine Islands.

Various articles used in the homes of the Filipinos.

COLLECTION 1463.

Philippine Islands: Clothing, etc.

Articles of clothing worn by the inhabitants of the Philippines.

COLLECTION 1464.

Philippine Islands: Agriculture.

Models of agricultural implements used on the Philippine Islands.

COLLECTION 1465.

Philippine Islands: Fishing and Hunting.

Articles used by the Filipinos while fishing and hunting.

COLLECTION 1466.

Philippine Islands: Transportation.

Models of carts, sledges, etc., used by the Filipinos.

COLLECTION 1332. (Previously listed.)

Illustrations: Philippine Islands.

Photographs illustrating occupations in the Philippine Islands.

COLLECTION 1288. (Previously listed.)

Illustrations: Philippine Islands.

Stereoscopic views illustrating life on the Philippine Islands.

STEREOSCOPIC VIEWS SHOWING VARIOUS MODES OF TRANSPORTATION.

From 6 to 10 Views in Each Collection.

COLLECTION 1467.

Transportation: On Land.

Transportation of people. Primitive and modern methods.

COLLECTION 1468.

Transportation: On Land.

Transportation of freight. Primitive and modern methods.

COLLECTION 1469.

Transportation: By Water.

Primitive and modern methods of transportation by water.

COLLECTION 1470.

Transportation: Aerial.

Methods of aerial transportation.

MISCELLANEOUS COLLECTIONS SHOWING THE MANUFACTURE OF VARIOUS ARTICLES.

REFERENCE BOOKS.

Chamberlain—How We Are Sheltered.
Clifford—Everyday Occupations.
Lewis—Modern Industries.
Patton—The Teacher's Aid.

COLLECTION 1471.

Manufacture of Ink.

Glass case showing the different Processes in the Manufacture of Ink.

COLLECTION 1472.

Manufacture of the Steel Pen.

Glass case showing the various Processes in the Manufacture of the Pen.

COLLECTION 1473.

Manufacture of the Needle.

Glass case showing the different Processes in the Manufacture of the Needle.

COLLECTION 1474.

Manufacture of the Lead Pencil.

Glass case showing the different Processes in the Manufacture of the Lead Pencil.

COLLECTION 1475.

Glass.

Glass cases showing the various Processes in the Manufacture of Glass.

COLLECTION 1476.

Leather.

Glass case showing the various Kinds and Products of Leather.

COLLECTION 1477.

Hide and Leather.

1. Green Hide, salted.
2. Hide unhaired and fleshed ready for tanning.

3-5. Harness Leather, in various stages of tanning process.

6. Finished Belting Leather.
7. Piece of Elephant Hide. Four years in tanning process.
8. Finished Harness Leather.
9. Raw Hide Lace-Leather.

COLLECTION 1478.

Materials Used for Tanning.

1. Hemlock Bark (Natural State.)
2. Ground Hemlock Bark, ready to be used in tanning.
3. Quebracho Chips. Obtained from a hard red wood which grows in Argentina and Paraguay.
4. Divi-Divi. Pods of a tree belonging to the Leguminosae. West Indies and Mexico. Largely imported into this country for tanning.
5. Turmeric. Underground stems of a plant of the ginger family grown in Southeastern Asia. Used in preparing fancy leathers.
6. Lungan Nuts. Fruit of Lungan Tree (Sapendaceae.) Japan.

COLLECTION 1479.

Manufacture of Shoes.

Various Processes in the Manufacture of a Shoe and the Materials Used.

COLLECTION 1480.

Materials for Dyeing.

1. Indigo Plant. Indigo is obtained from the Indigofera grown in tropical countries. Freshly cut plants are soaked in water which absorbs the juice, becoming greenish in color. On exposure to the air it turns blue. The Indigo separates, falls to bottom of tank and is dried.
2. Safflower. Dried flowers of an herb found in India, Persia and Egypt. Extract gives red dye for silk.
3. Orchilla Weed. Lichen growing in the Canary Islands. Extract furnishes beautiful purple dye.
4. Log-Wood. Leguminosae. Grows in Central America. Heartwood used for the manufacture of a red or black dye.
5. Brazilwood Leguminosae. Tropical America. Heartwood used for manufacturing red dye.
6. Red Sandal Wood. Leguminosae. Southeastern Asia. Furnishes red dye.
7. Fustic or Moraceae. Tropical America. Furnishes yellow dye used in dyeing woolen goods.
8. Annatto. Dried seeds of a shrub growing in South and Central America. From these a yellow dye for coloring butter and cheese is made.
9. Cochineal. Dried bodies of insects belonging to the plant-lice family living on cactus plants in Mexico and Central America. Furnish carmine color used in dyeing woolen fabrics.

To the Teacher:—

Use this blank page to insert additional collections 1481 to 1500, to be given in future Supplementary Catalogues.

COLLECTIONS OF APPARATUS TO ILLUSTRATE LESSONS IN PHYSICS IN THE 7th AND 8th GRADES.

REFERENCE BOOKS.

Bert-Paul—First Steps in Scientific Knowledge.

Culler—First Book in Physics.

Harrington—Physics for Grammar Grades.

Smith—Easy Experiments in Physics.

COLLECTION **1500.**

Difference Between Physical and Chemical Changes.

Apparatus: Four-inch platinum wire, two 3-inch bits of magnesium wire, flat nose pliers, alcohol lamp or Bunsen burner. (1) Heat platinum wire red hot. Note that on cooling there is no change. (2) Heat magnesium wire in flame. Note how it takes fire and burns with a brilliant light. Repeat the last experiment. Ask pupils for examples of each change. A hot iron, and a lighted candle are typical instances that suggest themselves.

NOTE.—Platinum wire and pliers must be kept and returned to the museum.

COLLECTION **1501.**

Cohesion and Adhesion.

Apparatus: Small spring balance, glass adhesion disk, pan of water. (1) Weigh disk "dry." Now lower disk to touch water and try to lift it by raising the balance. Note how much heavier the disk seems to be. When the disk finally separates, it brings layer of water with it. Does water stick more to water or to glass? Explain difference between the terms adhesion and cohesion, and let pupil see why water "wets glass."

COLLECTION **1502.**

Cohesion Acts Only at Small Distances.

Apparatus: Two lead bullets.

See that flat surfaces are carefully scraped flat and clean. Touch them together. They do not adhere. Why? Then press them together firmly with a twist—they now adhere so tightly that one will support the other. Why so?

COLLECTION **1503.**

Capillarity.

Apparatus: Three 6-inch glass tubes of unequal diameters, beaker. Fill beaker nearly full of water. Put the tubes into the water, and note how high the water in each one rises. In which one highest? Try a narrow strip of blotting paper in the same way. What raises the water? Try a strip of foolscap—why does not water rise in same way? (No pores.)

COLLECTION **1504.**

Crystallization.

Apparatus: Bottles of rock salt and alum and piece of quartz. Tell children how crystals are formed. If a little common alum is dissolved in hot water and a few drops are put on a bit of glass, as it dries out, the crystal will be seen. Do not uncork the bottles—these are only for "display." Perhaps the children can name some things they have seen as crystals, such as sugar, salt, snow, quartz. Children will be interested to see pictures of snow crystals, such as are shown in "Forms of Water."

COLLECTION **1505.**

Pressure of Liquids.

Apparatus: Battery jar filled with water, funnel tube. Close end of funnel tube with finger and plunge a little distance into water. Hold lighted match above tube and suddenly remove finger. Air blows out flame. Test again at greater depth. Match goes out quicker. What forces out air? What is true of pressure at different depths? If holes inside of jar are made at top, middle, or bottom, where would water run out fastest? Why?

COLLECTION 1506.

Archimides Principle.

Apparatus to use in studying the Archimedean Principle—that a body immersed in a fluid loses an amount of weight equal to that of the fluid it displaces—(to be used in the 8th Grade, Specific Gravity work.)

COLLECTION 1507.

The Lever and Its Uses.

Apparatus: Simple lever ,fitted with two weights. Test by putting weights at different distances, so as to balance in each. Prove that if load is further from pivot (fulcrum), power must also be further. Also, the contrary. Tell pupils several uses of lever, such as crowbar, scissors, poker, the forearm, etc.

COLLECTION 1508.

The Wheel and Axle.

Apparatus: The wheel and axle, some cotton cord, and a weight, such as a half brick. Tie weight to cord, attach to axle, and test by winding up cord to raise weight. It is easier to raise weight thus than to lift weight directly? Can pupils suggest any use of wheel and axle? (At wells, for lifting heavy stones, etc.)

COLLECTION 1509.

Weights.

Balance and set of weights for various kinds of work.

COLLECTION 1510.

Pendulum.

Apparatus to illustrate the Principle of the Pendulum.

COLLECTION 1511.

The Inclined Plane.

Apparatus: Inclined plane, weight pan, set weights. (1) Set plane at a small angle. Put just enough weights in pan to draw load up plane, if wagon is started. (2) Repeat, using a larger angle. (3) Repeat, using a still larger angle.

Now, let pupil see that power in pan required to pull same load in wagon depends on amount of slope. Why, then, is it so important to have no steep hills on a road? Why is a plank used in taking a barrel from a wagon?

COLLECTION 1512.

Uses of the Screw.

Apparatus: Model of the screw. Put a child's finger under the tip of the screw and turn down carefully. He will feel the pressure. Call attention to use of screw in carpenter's vise in like manner to give pressure for holding wood. Show pupils how hand at end of lever moves around circle, while screw moves forward, small space of "pitch" of screw. Here lies advantage of screw—power can move a long distance, while screw advances a small distance.

COLLECTION 1513.

Heat Produced by Hammering.

Apparatus: Strip of bar lead, hammer and anvil. Let pupil feel lead, at first cold. Now strike lead a heavy blow on anvil—note how it has instantly grown hot. What has warmed it? Why does hot iron bar glow so brightly when struck with hammer by Blacksmith? Why does match light, when hit a blow on the head?

COLLECTION 1514.

Flint and Steel.

Apparatus: Hardened steel and flint. Strike steel on flint and note the sparks set off by the blow. If the spark fall into powder or other material readily set on fire, it will light and burn. It was thus that fires were lighted before matches were invented.

COLLECTION 1515.

Heat Due to Compression of Air.

Apparatus: Fire syringe, bit of tinder, sent in envelope. Show pupil that tinder is not lit. Now put bit of tinder into hollow end of piston of fire syringe, fit piston carefully into end of syringe and force suddenly to bottom. Remove piston—if successful, tinder will be found lighted and glowing. Blow on the coal to make this plainer. What has lighted the tinder?

COLLECTION 1516.

Conduction of Heat by Solids.

Apparatus: Six inches of iron wire,

alcohol lamp or Bunsen burner, a few matches. Heat end of wire in flame and test with match head whether heat travels along the wire.

COLLECTION 1517.

Unequal Conducting Power of Different Solids.

Apparatus: Six inches of iron wire, 6 inches of copper wire, alcohol lamp or Bunsen burner, a few matches. Heat the wires at one end. Test with match to see which conducts heat furthest. Why is bottom of wash boiler made of copper? Why are sides best made of (tinned) iron?

COLLECTION 1518.

How Heat is Distributed in Liquids.

Apparatus: Tubular rectangle of glass, filled with water, a few drops of ink put into opening at top, an alcohol lamp or Bunsen burner. Heat cautiously at one corner over lamp. Notice how ink travels down further side. How is heat transferred? Why do we heat water at the bottom? How is water heated in the kitchen hot water tank?

COLLECTION 1519.

How Heat is Distributed in Gases.

Apparatus: Ventilation apparatus, fitted with short candle, a few matches. Light candle and replace chimney. Try effect of stopping up (1) Top of chimney above candle, (2) Top of other chimney. Note hot air rises in chimney over candle. Shake two chalk erasers over other chimney . Note how cool air descends. Why is it so hot above a lamp? Why is it so much cooler just below a lamp flame? (A card can be put over chimney, to close it up.)

COLLECTION 1520.

Solid Expansion by Heat.

Apparatus: Copper ball and ring, alcohol lamp or Bunsen burner. Test cold ball and ring. Show that ball passes through ring. Now heat ball over lamp. Note how hot ball will no longer pass through cold ring. Why so? What has happened to ball? Plunge ball into water to cool. Wipe dry. Now heat ring. Show that hot ring is a loose fit to ball. Why? Ask children if they have seen blacksmith put tire on wagon wheel. If so, get some one to tell how it was done.

COLLECTION 1521.

Expansion of Liquids.

Apparatus: Flat bottom flask, rubber stopper, 8-inch length of glass tubing, alcohol lamp or Bunsen burner. Remove stopper, fill flask with water. replace stopper. Water should now stand about 2 inches high in tube. If need be, repeat till water stands at right height. Now cautiously heat flask over lamp. Note that water at first falls. Why so? Then heat once more but longer. Note that water now rises. Why so? Can you tell how a mercury thermometer, such as you have at school works?

COLLECTION 1522.

Expansion of Gases.

Apparatus: Air-thermometer, tube and bulb, glass of water. Take thermometer in hand, holding by the stem. Put lower end of stem into water. No air comes out. Now hold bulb in hand. Soon air begins to bubble out. Does bulb hold less air than before? Why does air flow out? Now take hand from bulb. Note that water now rises in stem. Why so? When done, warm bulb with hand until all water escapes, dry carefully at open end with blotter.

COLLECTION 1523.

Use of Prism.

Apparatus: Four-inch prism. Let pupil note that pencil seen through prism seems bent—Why? This occurs if pencil crosses length of prism—not if parallel to it. Now let sunlight fall on prism—receive spectrum on sheet of white paper. Tell pupils of Sir Isaac Newton's studies in physics, and how he produced the colors of the rainbow, or spectrum. Can any child name the colors in order? (r, o, y, g, b, i, v,).

COLLECTION 1524.

Images Formed by Convex Lenses.

Apparatus: Pocket magnifier, (lighted) candle, piece of ground glass. Af-

ter candle is lighted, throw image on ground glass with lens. Try at different distances, making image sharp each time. How can image be made larger? Smaller? Have any pupils seen picture on ground glass of camera?

COLLECTION **1525.**

Lenses Used as Magnifiers.

Apparatus: Pocket magnifier, fine print used for testing. Let pupil see (1) how lens gives enlarged image; (2) that this image seems nearer than print. Show pupil that fine print can be read only at a small distance. The lens enables you to see the print just as if it were much nearer, which the eye unaided could not do.

COLLECTION **1526.**

Miscroscope and Its Uses.

Apparatus: Microscope, bit of thin paper, bit of fine linen. Let pupils examine these objects. Notice how the fibers can be seen. For what, then, is the microscope used? Can the pupils tell any use of the microscope? Could you use it to tell wool from hair? (Which is round? Which flattened?)

COLLECTION **1527.**

Magnifiers.

Set of 15 small tripod magnifiers, to be used for class work.

COLLECTION **1528.**

Sound Due to Vibrations.

Apparatus: Tuning fork, tumbler of water. Strike tuning fork on a small block of pine wood. Test by putting it into water in tumbler. Let fork in vibration touch end of pencil held lightly between fingers at other end—the vibration will hit pencil a blow. Repeat with call bell used on desk of teacher.

COLLECTION **1529.**

Sounds of Strings in Vibrations.

Apparatus: Sonometer, wire in place, key for tuning, bridge to change length of string. (1) Pluck wire and test for vibration with pencil held against wire. (2) Slacken wire—note lowering of pitch. (3) Tighten wire—note rise of pitch. (4) Use bridge to shorten wire, by setting bridge under wire—note rise of pitch. How is a violin tuned? How are different notes obtained? How are louder and softer notes obtained? Show by plucking string so as to obtain them.

COLLECTION **1530.**

Sounds of Air in Vibration.

Apparatus: Organ pipe, fitted with sliding piston. Try effect of pulling piston out to mark "C" and blowing gently. Now blow harder. Note change. Push piston in to mark "A." Test again. Note change of pitch. How is length of air column changed? How then may the pitch of an air column be changed? Suggest trombone to pupils for illustration.

COLLECTION **1531.**

Poles of Magnet—Meaning of—Place of

Apparatus: 6-inch bar magnet, ⅛ lb. wire brads. Test each end of magnet. Do brads adhere? Test middle of magnet. Do brads adhere? Where are the poles? Can you name the poles? What do the letters N. and S. mean on the magnet?

COLLECTION **1532.**

Forms of Magnets.

Apparatus: 6-inch bar magnet, 6-inch horseshoe magnet, ⅛ lb. wire brads. Test bar magnet—count number of brads it will lift. Test horshoe magnet—note the latter is something like four times as strong. Which would be used to lift a heavy mass of iron? Why so?

(All apparatus to be returned.)

COLLECTION **1533.**

North and South Poles—Meaning of.

Apparatus: 6-inch bar magnet, stirrup-loop of string, so that magnet can turn freely. A loop of No. 8 cotton thread will be better, as it is more flexible. Let magnet be supported by thread and allowed to turn. In what direction does it at last point? What letter do you find on the end pointing

north? What then is the north pole? The south pole? Does a magnet always point to the north? Not if iron or a magnet is near, nor if it is not free to turn.

COLLECTION 1534.

Making of Magnets.

Apparatus: Darning needle, 6-inch bar magnet, a few wire brads. (The magnet and needle MUST be kept apart, until used as directed.) Needle will be sent in separate envelope. Test needle with brads to show that needle is neutral. Stroke needle three or four times from eye to point, using north pole of magnet. Test needle with brads. What change has occurred? Lay needle on table. Test with magnet. Which end of needle is now north pole? Which south pole?

(Send back magnet—keep needle, as it cannot be used again for this experiment.)

COLLECTION 1535.

How Magnets Act on Each Other.

Apparatus: Two 6-inch bar magnets. Tie loop of string about one magnet, stirrup-like, so as to support it. and allow it to turn freely. Let one pupil hold magnet steadily by string. Bring north pole of other magnet to north pole of suspended magnet. What happens? Bring south pole to south pole. What happens? Bring north pole to south pole. What happens? When do poles attract each other? When repel?

COLLECTION 1536.

All Parts of a Magnet Are Really Magnetized.

Apparatus: 6-inch bar magnet, a knitting needle. (Keep needle from magnet, as in last experiment, till ready to use it.) Magnetize needle by stroking with magnet. Test ends and middle, using brads to locate poles. Break needle in center. What is now true of each end? (Pole appears at each broken end.) The middle was really magnetized, though it did not appear so till the needle was broken in half. If possible, break each half of the needle in two—test as before, with same results.

COLLECTION 1537.

Inductive Action of Pole on Pole.

Apparatus: Two 6-inch bar magnets, ½ lb. wire brads. Dip pole of one magnet into brads and put on a chalkbox so that brads may hang down. Now slowly bring like pole of other magnet under first pole. Some brads fall off. Why so? Readjust magnet with brads as at first. Test by putting unlike pole under first pole. Some more brads can be supported. Inference: like poles weaken one another; unlike poles strengthen each other. Why, then, is horseshoe magnet four times as strong as bar magnet? (Two poles and inductive action account for this.)

COLLECTION 1538.

The Dipping Needle—Magnetism of Earth.

Apparatus: Dipping needle, 6-inch bar magnet. Set the dipping needle on the table, along a north and south line. Put north pole of magnet below needle. What occurs? Put south pole of magnet below needle. What occurs? Remove magnet. Notice dipping of needle. What causes needle to dip? (Magnetism of earth.)

COLLECTION 1539.

Electrification by Friction.

Apparatus: Stick of sealing wax, flannel pad, some bits of tissue paper. Show that wax does not at first attract paper. Rub wax with flannel and test for attraction. Notice how bits of paper are attracted and then repelled. The bits of paper after touching other objects are once more attracted, then repelled. Carefully rub hand over wax, to remove charge—paper is no longer attracted. A body that can attract others, as the wax did, is said to be electrified.

COLLECTION 1540.

Electrification by Friction (Continued).

Apparatus: Hard rubber rod, flannel pad, pith ball with silk thread, glass rod, piece of silk. Test each rod at first—note that it does not attract pith ball. Rub rubber rod with flannel. Test with pith ball. What occurs? To prepare glass rod for use, first rub it with

cloth on which has been put a drop, not more, of oil, so as to make it perfectly dry. Now rub glass with silk. Test with pith ball. What occurs? What do we say of the two rods? (They are now charged.)

COLLECTION 1541.

Electrical Attraction is a Mutual Attraction.

Apparatus: Hard rubber rod, flannel pad, stirrup-loop of silk thread, pencil. Suspend pencil in loop of thread. Excite rod with flannel and bring near pencil. What occurs? What does this show? Then put rod into loop. Bring pencil near. What occurs? What does this show? Summary—Rod attracts pencil; pencil attracts rod. Why does but one of them move? If time permits, answer this last by arranging two loops, with pencil in one and rod in other. Bring near together; both will move, thus finally proving that attraction is mutual.

COLLECTION 1542.

Positive and Negative Charges.

Apparatus: Two hard rubber rods, flannel pad, two glass rods, piece of silk, supporting stirrup of silk thread. Excite rubber rod and hang in stirrup. Excite second rubber rod and present to suspended one. What follows? Repeat, using glass rods. What follows? Then put excited rubber rod into stirrup. Test with excited glass rod. What follows? We call charges of two rubber, or two glass rods, like; of a rubber and a glass rod, unlike. That of glass is called positive; of rubber, negative. What law of attraction and repulsion does the experiment establish? (Like charges repel each other; unlike, attract each other.)

COLLECTION 1543.

Two Charges Produced Together.

Apparatus: Hard rubber rod, flannel cap with silk thread attached, bits of tissue paper. Let pupil at first see that neither rod nor cap attracts paper. Put cap on rod and rub by twisting. Test cap and rod while cap is still in place (neutral). By means of thread, remove cap, test rod and cap—both are charged. Slide cap on rod once more (both neutral). The two charges cancel each other, when united. Notice that excited rod attracts excited flannel. The charges are then unlike. Why so? (Law of action between like and unlike charges is involved).

COLLECTION 1544.

The Electro-Magnet.

Apparatus: Electro-magnet, dry battery, $\frac{1}{8}$ lb. wire brads, two 2-foot lengths copper wire. Test with brads to see if iron core will pick any brads (none). Now connect one wire from battery to magnet. Connect one end of other wire to battery. Hold remaining end of wire to binding post of magnet and test core for magnetism. See how many brads adhere. Detach wire and test again. (Magnetism lost.) Repeat, as pupils will be interested. When only is core a magnet? (While current flows.)

COLLECTION 1545.

The Electric Bell.

Apparatus: Dry battery, three 1-foot pieces copper wire, electric bell. Join one piece of wire to battery and to bell. Join second piece of wire to battery. Join the third piece of wire to bell. Touch free ends of second and third wires together. Notice that bell rings. Break circuit. Remove cover from bell. Block hammer of bell with pencil, so that it cannot hit bell. Touch ends of wires again. Test electro-magnet for magnetism, with knife-blade. Hold hammer against bell. Touch wires again and test for magnetism. Let pupils see why armature is pulled forward so that hammer hits bell. Why released? What must you do to ring bell?

COLLECTION 1546.

The Telegraph.

Apparatus: Dry battery, two pieces copper wire, each 2 feet long, telegraph instrument. (Caution: In joining these instruments be careful not to leave switch of key closed, as this will exhaust the battery.) Join wires to apparatus. Press down key. Notice click at sounder. Release key. Notice another click of different sound. What

causes click? Test sounder, after pressing down key—notice how it will attract a knife-blade—the iron core has become a magnet. Where are the wires of the real telegraph? (On the poles.) How are messages sent? Explain meaning of "dots" and "dashes." What do we find in the station? (The battery, key and sounder.) Outside? (The "line.") Be sure that pupil understands that sounder may be many miles from key.

COLLECTION 1547.

The Electrophorus.

Apparatus: Electrophorus, catskin, some small bits of tissue paper, electroscope. Rub bed of electrophorus with catskin. Put metal disk on bed and touch it with finger. Lift disk off, using handle to prevent escape of charge. Test for a charge. Note how electroscope leaves separate, if charged disk is brought near it, but collapse when disk is removed. Put some bits of paper on disk, while resting on bed. Touch disk with finger and remove disk. Account for what takes place.

COLLECTION 1548.

Nature of Lightning.

Apparatus: Toepler-Holtz machine. Let pupil see the spark produced by turning the machine. Set the balls about ¼ inch apart, and let him touch both balls with thumb and finger. Note spark and shock that follows. Tell them how Benjamin Franklin sent up his kite during a thunderstorm and on presenting his knuckle to lower end of string drew a spark and received a shock just as pupil has just received from the machine. What did Franklin infer in regard to the nature of lightning? What follows the spark of machine each time? What in like manner follows the lightning flash? What is the cause of thunder?

COLLECTION 1549.

Lifting Pump.

Apparatus: Lifting pump, tumbler of water. Let pupils see the parts—suction pipe, cylinder, piston, piston rod and handle, suction valve, piston valve, spout. Ask them to watch working of pump, when suction pipe is put into tumbler and two or three strokes are made. Let some explain the use of each part. Can the pupils tell when the suction valve opens? Why? What is its use? When the piston valve opens? Why? What is its use?

COLLECTION 1550.

The Force Pump.

Apparatus: Force pump, tumbler of water. Let pupils see the parts—suction pipe, cylinder, piston, piston rod, and handle, spout, spout valve, air dome. Ask them to watch working of pump, when suction pipe is put into tumbler and two or three strokes are made. Let some explain the use of each part. Can the pupils tell when the suction valve opens? Why? What is its use? When the spout valve opens? Its use? Why it opens? The air dome's use?

COLLECTION 1551.

The Airpump—I.

Apparatus: Airpump, closed bell jar, beaker. Put bell jar on pump plate and make a few strokes. What now holds jar in place? Readmit air to jar, by opening valve in tube between plate and pump. Why can you now remove jar? Put some hot water in beaker. Set the beaker on pump plate. Replace jar and exhaust. Why does hot water now boil? Where does this occur in nature? (The air pressure on mountain tops is lessened—what effect has this on the boiling point of water?)

COLLECTION 1552.

The Airpump—II.

Apparatus: Airpump, open bell jar, sheet rubber 4x4 inches, two pieces parchment paper 4x4 inches. Tie rubber on open top of jar. Set jar on pump plate, and make a few strokes. What causes rubber to bend in? Readmit air to jar. What now causes rubber to flatten once more? Repeat, exhausting more completely. Why does rubber swell so far into jar? Remove rubber. Wet the parchment paper well in water and tie carefully over top of jar. Exhaust till paper bursts. What causes the paper to burst? Did it burst

inward or outward? Why? Repeat, so that all may see clearly.

COLLECTION 1553.

The Airpump—III.

Apparatus: Airpump, bell jar with closed top, pine block about 1x1x1 inch, lead bent into U as a sinker, tumbler. Put wood into tumbler, with lead to hold it in place. Fill tumbler nearly full of water. Set on pump plate, cover with jar and exhaust. Whence come the air bubbles that rise in the water? What did the wood contain? Readmit air to jar. Repeat experiment, using a chalk crayon, unvarnished. Do you find air in the chalk? Can you name other solids that contain air?

COLLECTION 1554.

The Flame of Bunsen Burner or Alcohol Lamp.

Apparatus: Bunsen burner, 4-inch piece of platinum wire, 5-inch flat pliers. After burner is lit, cut off air supply at bottom. How does flame now look? Put wire into flame at top for a moment, remove and look for soot. Did the bright flame contain any solid? Now open air supply. Note hot, colorless flame. Let pupil see the outer and inner cones of flame. Put wire into inner cone—lower part of flame. Does the wire heat rapidly? Now put wire into upper part of flame—tip of inner cone. Note how fast wire heats. Can pupils recall a flame like this? That of common gas stove is similar. (If flame of gas stove burns brightly, is it hotter or cooler than the colorless flame? Test Bunsen burner with wire. Where does wire heat slowly? Where rapidly?) If alcohol lamp is used, omit what is put in parentheses.

COLLECTION 1555.

The Steam Engine—I.

Apparatus: Steam engine, test tube, test tube holder, cork, Bunsen burner, or alcohol lamp. Fill test tube one-half full of water and put cork in, not tightly. Set test tube into holder and boil carefully over flame. Soon cork will be forced out. (Great care will be needed, lest the boiling water thrown out when the cork is ejected, splash over some pupil. The teacher should try this privately and learn how tight to put in the cork. Do not point tube toward pupils.) What forces out the cork? Can pupils tell what will happen, if cork fits too tight?

COLLECTION 1556.

The Steam Engine—II.

Apparatus: Steam engine, test tube, test tube holder, cork, Bunsen burner, or alcohol lamp. Let pupils see test tube and recall what happened on boiling the water. Tell them that a steam engine is a machine in which steam does work, just as the steam pushed out the cork from the test tube. Explain the boiler, the cylinder, the piston (or cork), the fire, the fly wheel. Have pupils seen an engine? Where? Is a locomotive one? How does a locomotive "run?" What happens when fire is too hot? (Boiler bursts.) Show them safety valve and explain its use. (If cautiously opened, the engine will stop for lack of steam.) Tell them how the safety valve lessens risk of explosion.

COLLECTIONS OF APPARATUS TO ILLUSTRATE LESSONS IN PHYSICAL GEOGRAPHY.

V. GRADE, 3D QUARTER.

COLLECTION 1557.

Advanced Geography—Page 5.

The Earth's Shape.

Apparatus: Croquet ball, thread, white paper. Fasten the thread to the ball. Suspend ball so that sun casts shadow of ball on paper. Set ball to twisting. Note that shadow continues of round form. What can you say of a body that always casts a round shadow? What is the shape of the shadow of the earth cast on the moon during an eclipse?

COLLECTION 1558.

Advanced Geography—Page 5.

The Earth a Spheroid.

Apparatus: Whirling table, brass hoops. Rotate hoops very slowly and

note circular form. Then rotate rapidly. Note spheroidal form. Explain change from spherical to spheroidal form. What can you tell of the earth, which this experiment explains?

COLLECTION 1559.

Advanced Geography—Page 6.

Day and Night—Explained.

Apparatus: Globe. Put globe in sunlight and turn it so that North America is in the sunlight. This will correspond to day. Now turn globe one-half turn. Note how North America now has night. Explain to pupil how rotation of earth causes day and night, just as turning the globe put North America into light or shadow. (Museum does not furnish globe for this experiment, since every school is supplied with same.)

COLLECTION 1560.

Advanced Geography—Page 6.

Light Given Off by White-hot Solids.

Apparatus: 4-inch platinum wire, pliers, Bunsen burner, or alcohol lamp. With pliers hold wire in flame. When does the hot wire give out most light? What is meant by "white-hot?" Have pupils seen white-hot solids? (Incandescent lamps, iron at forge, "limelight" at theater.)

COLLECTION 1561.

Advanced Geography—Page 6.

The Compass.

Apparatus: Compass, large nail. How may compass be used to find the north? Does it point to the true north? Put nail near north pole of compass. What must be kept away from a compass if it is to point to the north? Why does the compass turn on a jewel? Why is the compass lifted off the jewel when not in use?

COLLECTION 1562.

Advanced Geography—Page 6.

Location of Points on the Earth's Surface.

Apparatus: Clay ball. Let some one make a mark with a pencil point on surface of ball. How could this be located? Now draw two circumferences on ball at right angles. Show how the point can now be located as so much to right or left of vertical circumference, and so much above or below the horizontal circumference. This may help pupils to grasp the use of meridians and parallels. How are places located in the city? (So many feet from a given street, etc.)

COLLECTION 1563.

Advanced Geography—Page 7.

How Latitude and Longitude Are Measured.

Apparatus: Globe fitted with two divided circles, one parallel to equator, one parallel to meridians. Rotate globe, Let pupils see how all points of same latitude pass under same point of the meridian circle, in succession. Also, how all points on same meridian pass under meridian circle at same moment. Use pair of compasses to show: (1) Parallels of latitude shorten as pole is approached: (2) Meridian of longitude is of same length for a given arc at all points.

COLLECTION 1564.

Advanced Geography—Page 12.

Volcanic Explosions.

Apparatus: Test tube, test tube holder, Bunsen burner, or alcohol lamp, cork for test tube. Fill test tube three-quarters full of water. Hold over flame cautiously. (Do this over a newspaper laid on desk and point tube away from pupils.) Note how bubbles form at bottom and water is then thrown out. Then fill test tube half full of water, cork GENTLY, and repeat heating, taking care that tube does not point toward pupils. Note how cork is at last thrown out with great violence —an explosion, in fact. Can pupils explain volcanic explosions? Did they note how test tube shook at moment of explosion? Can they explain the earthquakes that accompany volcanic explosions?

NOTE. Great care on the part of the teacher is necessary in this experiment.

COLLECTION 1565.

Advanced Geography—Page 13.

Expansion by Frost.

Apparatus: Test tube, copper beaker,

cork. Fill test tube full of water, cork securely. Put into the beaker some cracked ice and salt, one-third salt, two-thirds ice. Set test tube upright into freezing mixture, put beaker on newspaper on desk. Wrap beaker in a towel to exclude heat that would waste ice. What occurs as the water in test tube freezes? Have pupils seen sidewalks raised by frost in the winter time?

COLLECTION 1566.

Advanced Geography—Page 13.

Atmospheric Moisture.

Apparatus: 2-oz. flask, cork, some ice water, some hot water. Fill flask with ice water, cork securely. Invert and let flask stand two or three minutes on desk. Let pupils note formation of dew. Whence came the dew? Now empty flask and refill with hot water. Repeat as before. Note that no dew is formed. On what does formation of dew depend? Will hot air or cold air hold most moisture? If out of doors it is cold, try putting flask of ice water out of window. Let pupils see that cold air will not form dew in contact with cold flask, while hot air will do so.

COLLECTION 1567.

Advanced Geography—Page 13.

Solids Left Behind in Evaporation.

Apparatus: Small piece of window pane,. some strong brine. Let pupils note that no salt can be seen, though it can be tasted. The salt is "dissolved" Now put a few drops on the clean glass, and spread it over the surface. Put the glass into sunlight, to hasten evaporation. Soon the water disappears—what becomes of it? The salt appears as small white crystals on the glass.

COLLECTION 1568.

Advanced Geography—Page 13.

Vapor of Salt Water Pure.

Apparatus: Two 2-oz. flasks,. test tube holders, some strong brine in one flask, some cold water in the other, Bunsen burner, or alcohol lamp. Hold brine flask over flame until boiling begins. Then hold cold flask in escaping steam. Let some one taste dew condensed on flask, and ascertain if it is salty. Where is salt left? Compare what is said on page 15 of textbook of the salt carried down by streams into lakes, etc.

COLLECTION 1569.

Advanced Geography—Page 14.

Cloud Formation.

Apparatus: 2-oz. flask, test tube holder, Bunsen burner. Fill flask two-thirds full of water, and hold over flame till the water boils. Remove flask and hold at open window for a moment. Let pupils see cloud of escaping steam. Have pupils seen such clouds before? (Steam escaping from engine exhausts.) Bring flask into room—cloud disappears. Why so? Can pupils tell why a morning mist disappears as sun rises? What is dew? Hoar-frost? Their cause?

COLLECTION 1570.

Advanced Geography—Page 14.

Springs.

Apparatus: Flower pot, filled with sand, flower pot saucer. Let pupils see that saucer is dry. Pour some water on the sand. In a few minutes, water begins to ooze from bottom of pot into saucer. How did it reach this place? Springs are simply the outlets for "ground water"—the water passing through the earth, as it did through sand in the experiment. It will add much to the interest of the experiment if the water poured on the sand is muddy—that oozing out at the bottom will be clearer. Let student explain this. Also, why spring water is usually clear.

COLLECTION 1571.

Advanced Geography—Page 14.

Springs and Water Level.

Apparatus: Equilibrium tube. Let pupils note difference in form and size of tubes. Now fill tubes partly with water. To what height does water rise in each tube? If one of the tubes is cut shorter, what would water do in that tube? How does the artesian well supply water? How do our city water pipes supply water?

COLLECTION 1572.

Advanced Geography—Page 15.

Salt Present in Water.

Apparatus: 4-inch platinum wire. pliers, Bunsen burner, or alcohol lamp,

some brine, hydrant water. Dip wire into brine and hold in flame. Note yellow color. When color disappears, dip wire into hydrant water, and repeat. Does yellow color reappear? If so, what does hydrant water contain? How, then, do you account for "salt lakes?"

COLLECTION 1573.

Advanced Geography—Page 15.

Lime Present in Water—Hard Water.

Apparatus: Two test tubes, corks, bottle distilled water, some soap. Cut some soap into fine shavings. Put some distilled water into one test tube, and hydrant water into the other. Add soap shavings to each. Cork securely and shake. Note the formation in the hydrant water of a white, curdy substance; the distilled water simply "lathers." This is a familiar test for hard water, i. e., water containing lime.

Get from the Museum, specimens of "stalactites" and "stalagmites." Can pupils explain the formation of these? Consult what is said of water as it evaporates, on page 13.

Advanced Geography—Page 19.

Glacier Formation.

Apparatus: Some snow. Let pupils note how loosely the crystals lie. Now make a snowball with gentle pressure. Examine carefully. Roll the ball under heavy pressure. Note how it gradually hardens into a more solid mass. Wet it now slightly and roll again under still heavier pressure. Note how it at last becomes almost as solid as ice. A glacier is a mass of snow consolidated under pressure in large masses, and the water sinks through the snow to the bottom, thus aiding the packing into ice.

COLLECTION 1574.

Advanced Geography—Page 20.

Work of Glaciers.

Apparatus: Two blocks of soft pine, some sand. Put some sand on one block and rub the other block over the lower one, using heavy pressure. Note how grains of sand become set in upper block and cut scratches in lower one. In same way, stones become imbedded in moving glacier, and cut and scratch the rocks over which the glacier passes. Note, too, that if blocks are wet, sand cuts faster. The same is true of glacier cutting. Can pupils explain how the bottom of a glacier becomes wet? (Water from top descends in the crevices to the bottom.)

COLLECTION 1575.

Advanced Geography—Page 23.

The Seasons.

Amount of heat falling on surface varies with the ANGLE.

Apparatus: Burning glass, some matches. Let sunlight fall on lens at right angles. Put match at focus and note how easily it lights. Repeat, letting sunlight fall at an oblique angle on lens. Note how much longer is required to light the match. Why so? The lens is the same and has the same surface. When will sun's rays be warmest? If something is to be warmed by the sun, why are we careful to put its surface at right angles to the sunlight?

COLLECTION 1576.

Advanced Geography—Page 23.

The Seasons.

Apparatus: The Tellurian. This can be used with profit to make clear to pupils the inclination of the earth's axis, the varying length of day and night, the difference of temperature between day and night, the succession of the seasons, the equinoxes, etc.

COLLECTION 1577.

Advanced Geography—Page 24.

Density of Atmosphere.

Apparatus: Barometer tube, glass mortar, beaker, meter rod, 1 lb. mercury in bottle. Fill tube with mercury, using beaker for pouring. Put finger on upper end, invert tube and put into glass mortar which contains rest of mercury. Note how mercury sinks to something like 29 or 30 inches above that in cistern. What supports mercury? What happens when barometer is taken up a hill? If the air grows heavier? When a storm is approaching? If a

storm is ending? Note—In removing mercury, raise tube for an instant out of mercury, replace and wait till air-bubble reaches top of tube. Repeat several times till all mercury is removed. Pour from cistern into beaker and thence into tube. Take care not to jar anything containing mercury, lest breakage result.

COLLECTION 1578.

Advanced Geography—Page 25.

The Winds.

Apparatus: Bunsen burner, or alcohol lamp, piece of cardboard, thermometer. Light burner and strike two blackboard erasers together near flame. Note how chalk dust rises. Hold thermometer some distance above flame, Note how fast temperature rises. Put cardboard at a slant above flame. Note how current of warm air is deflected. Why does hot air rise? Why does a hot-air balloon rise?

If possible, have someone bring a clay pipe to school and blow some soap-bubbles. Why does the soapbubble at first rise—later sink? Try blowing a bubble by connecting the gas to the pipe by means of the rubber tubing—note how the bubble continues to rise until it breaks. What causes this difference? (Gas is lighter than either warm or cool air.)

Advanced Geography—Page 25.

The Winds (Continued).

If air out of doors is much cooler than in the room, let a pupil open the window. Use lighted candle to determine direction of air current at bottom and top of open window. This may also be done by using two erasers struck together, so as to jar off the chalk dust.

Now, winds act, in a large way, just as did the air currents in this trial—cold air blows below towards warm air; warm air blows above towards cool air.

Advanced Geography—Page 26.

Rainfall.

The condensation of moisture which causes rain is well illustrated by the "rain" from an exhaust steampipe. When the steam passes out of such a pipe in winter, objects on the leeward side are wet as with rain. Can pupils explain this? What causes the steam to condense?- What causes the cloud from one's breath in frosty weather?

To the Teacher.

Use this blank page to insert additional collections 1581 to 1600, to be given in future Supplementary Catalogues.

LANTERN SLIDE LESSONS.

LANTERN SLIDES may be ordered, and will be delivered and called for by museum wagons, same as other museum material.

I. PURPOSE.—The lantern slide lessons are designed to clear and strengthen the topics already in the Course of Study, and to make the subjects more real and impressive. The lantern slide lessons are not to be considered as additions to the subjects of instruction in the common schools. They should be looked upon in the light of helps to the various studies by supplying illustration and pictorial explanation of the topics assigned to the various grades.

II. ADVANTAGES TO INSTRUCTION.—The lantern slide pictures presented on the screen are to give greater reality to the lessons of the book by appealing to the eye, to imagination and thought. They help to make the study of geography, for instance, a study of facts and actual conditions rather than of the words of the text-book. Pictures assist the memory and judgment alike, and convey to the child a clearer and more comprehensive impression of reality than can be done by verbal description alone. The study of geography, for instance, forms part of the work of every school in the country. The pupil learns at an early age about the ocean and the forms of land and water; in many cases the child engaged in this study has never left his native city and never seen a body of water larger than the ponds in the parks. The words of the book relating to such topics present no reality within his recollection. To such a child a lantern slide lesson with pictures of the ocean with its waves and storms; of bay and river, promontory, rocky shore and beach, will give knowledge which could not be derived from books and words alone. The pictures lend reality to the child's work.

III. METHOD OF PICTURE RECITATION.—A brief recitation or explanation should accompany each slide shown on the screen. This explanation should be given by the children themselves, as far as it is in any way feasible; it should be very brief, not more than could be written in three or four lines. A fuller explanation should be deferred. The lantern slide lesson should not be protracted by lengthy recitations. The time of twenty to thirty minutes should, under no circumstances, be exceeded. Where is seems advisable for a full understanding of the picture on the screen the teacher of the room or the principal may add a very brief word of further explanation. It is suggested that such questions be asked by the teacher at all points of the lesson as will invite the attention of the children to close observation of the picture before them. It would be a total departure from the intention and purpose of these lessons if they were given in the form of lectures or lengthy explanations. Each lantern slide lesson should be a series of very brief recitations and the children should be actively engaged in speaking and answering questions while the pictures are shown. They should not be merely passive spectators. The various topics should be assigned beforehand, and a brief explanation, **not exceeding thirty words,** prepared by each child to whom a topic is assigned. Each recitation should be strictly in reference to the picture on the screen, and not be a rambling talk on some subject which is but indirectly connected with the picture.

In history lessons special care should be taken in this respect. The entire period covered by the lesson is supposed to have been already studied in class, and might be reviewed the day previous to the lantern lesson. When the pictures are before the class the chief attention of pupils and teacher should be directed to the particular incident illustrated and not to the series of events that led up to or followed it.

IV. REVIEW OF LESSON.—The impressions of the lessons should be utilized by subsequent recitations and by composition work.

V. ARRANGEMENT OF THE CATALOGUE OF SLIDES.—A list of the slides owned by the Board of Education is printed below. They are arranged in sets so that the teachers need not select individual slides, but will find the pictures suitably arranged under the subject which they wish to illustrate.

VI. MAPS.—A slide with a map forms frequently the beginning of a lesson. These maps are not intended for **general** study but to briefly trace those special topics with which the lesson deals. The general subject of the lesson must always be kept in view in the use made of each picture. A scene in New Haven, Conn., introduced to illustrate foliage, manner of building, etc., in the temperate zone, is not to be treated in the same manner as if it occurred in a lesson on the New England States in general or as a locality famous in American history.

VII. DESCRIPTION OF SLIDES.—Owing to the difficulty on the part of teachers and pupils of preparing adequate descriptions of pictures not seen beforehand, a few words besides the title have been added in every case where the title is not a sufficient indication of the contents of the picture. When the subject is a well-known incident, building, work of art or locality, as, for example, "The Cherry Tree Incident," "Cathedral of Notre Dame," "Da Vinci's Last Supper," "Spouting Horn, Me.," etc., very little, if anything, has been added in explanation, owing to the ease and definiteness with which pupil and teacher can inform themselves on the subject.

VIII. MANAGEMENT OF THE APPARATUS.—From the list of lantern slide lessons herewith presented, principals and teachers may select such lessons as they consider best adapted to their schools. It is hoped that at no distant day each school may own a lantern.

One room in each school building has been fitted up for these lessons, and the classes will go to this room in rotation. No lantern slide lesson should be longer than twenty to thirty minutes. After each lesson the room should be well ventilated.

CLASSIFICATION OF LANTERN SLIDE LESSONS.

GEOGRAPHY—DESCRIPTIVE.

NORTH AMERICA.

Lesson **1600.** On the Great Lakes.
Lesson **1601.** New England States.
Lesson **1602.** Niagara, New York City and Boston.
Lesson **1603.** Trip from St. Louis to Washington.
Lesson **1604.** City of Washington.—No. 1.
Lesson **1605.** City of Washington.—No. 2.
Lesson **1606.** Indianapolis.
Lesson **1607.** Life in the South.
Lesson **1608.** Florida.
Lesson **1609.** City of St. Louis.
Lesson **1610.** History of St. Louis.
Lesson **1611.** Louisiana Purchase Exposition.—No. 1.
Lesson **1612.** Louisiana Purchase Exposition.—No 2.
Lesson **1613.** Louisiana Purchase Exposition.—Statuary and Sculptures.
Lesson **1614.** A Walk through the Public Schools of St. Louis.
Lesson **1615.** A Trip from San Francisco to St. Louis.
Lesson **1616.** A Trip through Colorado.
Lesson **1617.** Salt Lake and Western Trip.
Lesson **1618.** San Francisco, California.
Lesson **1619.** Mexico and Central America.
Lesson **1620.** West Indies.
Lesson **1621.** Hawaii.
Lesson **1622.** American Arctic Expedition.
Lesson **1623.** Greenland's Icy Mountains, or Whaling in the Arctic Regions.

SOUTH AMERICA.

Lesson **1624.** South America.

EUROPE.

Lesson **1625.** A Trip to Europe.—No. 1.
Lesson **1626.** A Trip to Europe.—No. 2.

Lesson 1627. England and Wales.—No. 1.
Lesson 1628. England and Wales.—No. 2.
Lesson 1629. Scotland and Ireland.
Lesson 1630. Spain and Portugal.
Lesson 1631. France.
Lesson 1632. Paris, France.
Lesson 1633. Germany.
Lesson 1634. North Central Germany.
Lesson 1635. South Central Germany.
Lesson 1636. Southern Germany.
Lesson 1637. Austria.
Lesson 1638. Switzerland.
Lesson 1639. A Trip Through Switzerland.
Lesson 1640. Italy.
Lesson 1641. Milan, Verona, Naples, Florence, Italy.
Lesson 1642. Venice, Italy.
Lesson 1643. Rome, Italy.
Lesson 1644. Greece, Past and Present.
Lesson 1645. Holland and Belgium.
Lesson 1646. Norway and Denmark.
Lesson 1647. Russia.
Lesson 1648. Russo-Japanese War and Russian Revolution.

ASIA.

Lesson 1649. British Empire in Asia.
Lesson 1650. Western and Central Asia.
Lesson 1651. A Trip to Asia,—(China and Japan).
Lesson 1652. A Visit in Japan.
Lesson 1653. Australia and the Islands of the Pacific.

AFRICA.

Lesson 1654. South Africa.
Lesson 1655. A Trip to Egypt.—No. 1.
Lesson 1656. A Trip to Egypt.—No. 2.
Lesson 1657. Egypt the Land of the Pyramids.
Lesson 1658. A Trip to Algiers.

MODES OF TRAVELING

Lesson 1659. Modes of Travel—On Land, on Water, in Air.

PHYSICAL GEOGRAPHY.

Lesson 1660. Some Forms of Land and Water.
Lesson 1661. The Ocean, (Elementary).
Lesson 1662. Ocean Tides.
Lesson 1663. Rivers, Valleys, Floodplains and Waterfalls.
Lesson 1664. Mississippi River System.
Lesson 1665. Volcanoes, Earthquakes and Geysers.
Lesson 1666. Glaciers, Past and Present.
Lesson 1667. The Upheaval of the Land.
Lesson 1668. The Wearing Away of the Land.—No. 1.
Lesson 1669. The Wearing Away of the Land.—No. 2.
Lesson 1670. The Zones.—No. 1.
Lesson 1671. The Zones.—No. 2.
Lesson 1672. Elementary Physical Geography.
Lesson 1673. Elementary Geology.
Lesson 1674. Atmospheric Agents and Phenomena.

INDUSTRIAL.

Lesson 1675. Agriculture or Our Bread and How We Get It.

Lesson 1676. Tea and Coffee.
Lesson 1677. Coal Mining or Underground Life.
Lesson 1678. Cotton.
Lesson 1679. Manufacture of Plate Glass.
Lesson 1680. Silk, and How We Get It.
Lesson 1681. Manufacture of Linen.
Lesson 1682. Lumbering and Mining.
Lesson 1683. Hunting, Fishing and Herding.

ASTRONOMICAL.

Lesson 1684. Astronomy.
Lesson 1685. Astronomical Geography.
Lesson 1686. Astronomical Diagrams.
Lesson 1687. Astronomy.

SCIENCE.

BOTANY.

Lesson 1688. Elementary Botany.
Lesson 1689. Some Plants and Trees Used as Food, Clothing, Medicine, Building Materials, etc.
Lesson 1690. Some American Mushrooms.
Lesson 1691. Some American Trees.
Lesson 1692. Twelve Common Trees.—(Colored Slides).

ZOOLOGY.

Lesson 1693. Animals.
Lesson 1694. Animals That Are Our Friends.
Lesson 1695. A Visit to a Menagerie.

HISTORY.

Lesson 1696. American History from 1492 to 1682.
Lesson 1697. Colonial Homes.
Lesson 1698. Colonial Furniture.
Lesson 1699. Colonial Costumes.
Lesson 1700. American History from 1755 to 1899.
Lesson 1701. Life of Washington.
Lesson 1702. Portraits of Men, Famous in Connection with American History.
Lesson 1703. Portraits of Various Educators, Authors, Artists, Inventors.
Lesson 1704. Life of Abraham Lincoln.
Lesson 1705. Life of U. S. Grant.
Lesson 1706. Portraits of Men, Famous in Connection with the History of Europe.

ART.

Lesson 1707. Historic Styles of Architecture.—No. 1.
Lesson 1708. Historic Styles of Architecture.—No. 2.
Lesson 1709. Great Artists and their Works.—No. 1.
Lesson 1710. Great Artists and their Works.—No. 2.
Lesson 1711. Portraits of Great Artists.
Lesson 1712. Millet and His Friends.
Lesson 1713. Art—Reproductions.

LITERATURE.

Lesson 1714. Curfew Shall not Ring To-Night.
Lesson 1715. Sheridan's Ride.
Lesson 1716. The Charge of the Light Brigade.
Lesson 1717. Paul Revere's Ride.
Lesson 1718. The Bridge.
Lesson 1719. Rip Van Winkle.
Lesson 1720. The Village Blacksmith.
Lesson 1721. Hiawatha.

Lesson **1722.** Evangeline.
Lesson **1723.** Merchant of Venice.
Lesson **1724.** Lady of the Lake.
Lesson **1725.** The Brook.
Lesson **1726.** Red Riding Hood.
Lesson **1727.** Cinderella.
Lesson **1728.** The Pied Piper.
Lesson **1729.** Snow White.
Lesson **1730.** The Ugly Duckling
Lesson **1731.** Chicken Little.
Lesson **1732.** Jack, Giant Killer.
Lesson **1733.** Puss in Boots.
Lesson **1734.** Tom Thumb.
Lesson **1735.** The Three Pigs.
Lesson **1736.** The Three Bears.
Lesson **1737.** Robinson Crusoe.

SLIDES ILLUSTRATIVE OF THE CLASSICS.

Lesson **1738.** Scenes in Northern and Central Greece.
Lesson **1739.** Scenes in the Peloponnesus.
Lesson **1740.** Slides Illustrative of Virgilian Scenes.
Lesson **1741.** Slides Illustrating Virgil's Aeneid.
Lesson **1742.** Slides Showing Roman and Pompeiian Scenes.

LANTERN LESSONS.

LESSON **1600.**

ON THE GREAT LAKES.

1. Map of North America. Locate Places to be Visited.
2. Chicago. Panorama Looking East. Grain Elevators and Lake Michigan in Distance.
3. Chicago. Railroad Station.
4. Chicago. Street with Buildings.
5. Chicago. Lincoln Park. Lincoln Statue.
6. Chicago. Lift Bridge. Halsted St.
7. Chicago. Cattle Pens.
8. Chicago. Piling Lumber. Very High Stacks.
9. Chicago. Lake Front, People, Pleasure Boat.
10. Chicago. Lake Steamer, Grain Elevator on Left.
11. Mich., Marquette, Whaleback Steamer.
12. Mich. Lake Michigan, Sand Dune, Sail Boat.
13. Mich. Mackinaw. Old Fort on Hill. Buildings near Lake.
14. Mich. Lake Superior at Ashland. Long Piers with Railroad Tracks extending far out into Lake.
15. Ohio, Cleveland. Euclid Avenue.
16. N. Y., Lake Erie at Buffalo, Beach, Lighthouse.
17. N. Y., Buffalo. Main Street from the Iroquois.
18. Canada, Toronto. University, Exterior.
19. Canada. Welland Canal Locks.
20. Canada, Ontario. Welland Canal. Canal Boat Drawn by Horses. Part of Lock Gate in Foreground on Left.

LESSON **1601.**

NEW ENGLAND STATES.

1. Me., Bar Harbor. Sporting Horn.
2. Me., Ship Building. View in Ship Yard. Hull of Ship.
3. Me., Granite Quarry. View of Quarry and Machinery.
4. Me., Lumber Region. Hauling Logs through Forest. Snow on Ground.
5. Me., Rangeley Lake. Log Cabins Pine Trees.
6. Me., Indian School House. Group of Pupils and Teacher.
7. Squaw and Papoose.
8. N. H., Portsmouth. Navy Yard, Sail and Row Boats.
9. N. H., White Mts. Crawford Notch. Lake in Foreground. Train of Cars in Distance.
10. Mass., Boston. Panorama Looking Southeast towards Harbor.
11. Mass., Boston. Old South Church.
12. Mass., Boston. Faneuil Hall.
13. Mass. Boston. Bunker Hill Monument.
14. Mass., Boston. State Capitol.

15. Mass., Boston. Soldiers' Monument. Boston Common.
16. Mass., Boston. Art Museum. Exterior.
17. Mass., Cambridge. Harvard College, Holden Chapel and Moss Hall.
18. Mass., Cambridge. Longfellow's Home, Exterior.
19. Mass., Lowell. Cotton Mills Driven by Water Power. Rapids in Foreground.
20. Mass., Plymouth. Panorama Looking towards Harbor.
21. Mass., Plymouth. Pilgrim Hall. Interior, Paintings on Walls: "Landing of Pilgrims." "Embarkation."
22. Mass., Fall River. Cotton Factory. Smoke Stack. Cotton Sheds on Left.
23. R. I., Newport. Beach. Sea Wall.
24. R. I., Newport. Old Mill.
25. Conn., Hartford. The Capitol.
26. Conn., New Haven. Temple Street. Arch of Elms.
27. Conn., New Haven. Yale College. Hall of Fine Arts and Stillman's Laboratory. Elm Trees.

LESSON **1602.**

NIAGARA—NEW YORK CITY AND BOSTON.

1. Niagara Falls, Distant View.
2. Niagara Falls. Steamers.
3. Niagara. Falls and Elevator.
4. Niagara. Cataract House.
5. Niagara. Above the Falls.
6. Niagara. Rapids above the Falls.
7. Niagara. Bridge and Elevator.
8. Niagara. Suspension Bridge.
9. New York. Statue of Liberty.
10. New York, from North River
11. New York. Steamer on North River.
12. New York from East River.
13. New York. Ferry.
14. New York. Wharf and People.
15. New York. World Building.
16. New York. Elevated Railroad.
17. New York. St. Luke's Hospital.
18. New York. Columbia College.
19. New York. Grant's Tomb.
20. Boston. Fountain in Commons.
21. Boston. Art Museum.
22. Boston. Massacre Monument.
23. Boston. Soldiers Monument.
24. Boston. Trinity Church.

LESSON **1603.**

TRIP FROM ST. LOUIS TO WASHINGTON.

1. Ill., Chicago. Clark Street.
2. Ill., Chicago. Auditorium Hotel, Exterior.
3. N. Y., Niagara. General View. American Falls. Goat Island, Horse Shoe Falls in Distance.
4. N. Y., Niagara. Falls in Winter.
5. N. Y., Lake George.
6. N. Y., Saratoga. Congress Hall.
7. N. Y., Saratoga. Congress Spring.
8. N. Y., Newburgh. Washington's Headquarters, Exterior.
9. Mass., Boston. Panorama. State House in Distance.
10. Mass., Boston. Old North Church.
11. Mass., Boston. Faneuil Hall, Exterior.
12. Mass., Boston. State House. Exterior.
13. N. Y. Hudson River. The Palisades.
14. N. Y. West Point. Battery. Hudson River.
15. N. Y. Sunnyside, the Home of Washington Irving. Tarrytown.
16. New York City. Grand Central Depot. Exterior.
17. New York City. Broadway.
18. New York City. City Hall. Panorama Looking West towards Hudson River.
19. New York. Long Island Sound. Steamer.
20. New York City. Stock Exchange.
21. New York City. Post Office.
22. New York City. Elevated Railroad. Chatham Square.
23. New York City. St. Patrick's Cathedral. Exterior.
24. New York City. Central Park. Obelisk.
25. N. Y., Brooklyn Bridge.
26. Pa., Philadelphia. Independence Hall, Exterior.

27. Pa., Philadelphia. Girard College, Exterior.
28. Washington, D. C. Capitol, Exterior.
29. Washington, D. C. White House Exterior.
30. Va., Mt. Vernon. Washington's Home.
31. Va., Mt. Vernon. Washington's Tomb.

LESSON **1604.**

CITY OF WASHINGTON, D. C.—No. 1.

1. Map. (To Locate Places to be Visited).
2. Washington. Capitol Building.
3. Washington. Capitol, another view.
4. Senate Chamber. United States Capitol.
5. House of Representatives.
6. Painting in Rotunda of Capitol; "Signing" the Emancipation Proclamation.
7. Washington Monument.
8. Washington. Capitol, Distant View.
9. Congressional Library. Exterior.
10. Congressional Library. Reading Room.
11. Washington. Library Fountain.
12. Washington. Library Fountain.
13. Washington. Treasury Building.
14. Washington. New Post Office.
15. National Museum. Exterior.
16. Pension Bureau. Interior where Inauguration Ball is Held.
17. White House. Exterior.
18. White House. Interior, East Room.
19. White House Conservatory. Interior.
20. Washington. Lincoln Statue.
21. Former Residence of Lee, Arlington, Va.
22. Steamboat Landing, Potomac River, Mt. Vernon, Va.
23. Portrait of Washington by Peale.

LESSON **1605.**

CITY OF WASHINGTON, D. C.—No. 2.

1. Pennsylvania Avenue Looking toward Capitol.
2. The Capitol. Exterior.
3. Capitol Hill. Rear.
4. The Senate. Interior.
5. House of Representatives. Interior.
6. Painting in Rotunda of Capitol: "Westward the Course of Empire Takes its Way."
7. Washington Monument Reflected in River.
8. Washington Monument.
9. Army and Navy Building. Exterior.
10. Congressional Library. Gallery and Stairway to Reading Room.
11. Library Fountain.
12. Library Fountain.
13. Treasury Department. Exterior.
14. Patent Office. Exterior.
15. National Museum. Interior.
16. President McKinley taking the Oath of Office, Front of Capitol.
17. White House. Front.
18. White House. Rear.
19. White House.
20. Garfield Statue.
21. Soldiers' Graves, Arlington, Va.
22. Washington's Residence. Mt. Vernon, Va.
23. Portrait of Martha Washington as a young woman.

LESSON **1606.**

INDIANAPOLIS.

1. State House and Street.
2. State House Cupola.
3. Library.
4. Soldiers' Monument.
5. Hendricks Statue.

LESSON **1607.**

LIFE IN THE SOUTH.

1. Tenn., Memphis. Dock Scene.
2. Tenn., Chickamauga. Soldiers' Monument.
3. Tenn., Tennessee River. Lookout Mt. in Distance.
4. Tex., San Antonio. Alamo Plaza.
5. Tex., San Antonio. San Jose Mission. Ruined Building.
6. Tex., Cow Boys Mounted.
7. La., New Orleans. Levee. Steamer Natchez, Gang Plank Lowered. Merchandise in Foreground to be Loaded on Steamer—Cotton Bales, Furniture, etc.
8. La., New Orleans. French Quarter. Old Houses Facing Street. High Walls. Door Opening on Inner Court.
9. La., New Orleans. Jackson Monument and St. Louis Cathedral.
10. Typical Southern Home. Broad Veranda. Shade Trees.
11. La. A Piney Woods Farmhouse on the Tchfunctcha River.
12. La. A Happy Southern Family. Negroes. Cabin. Cart Drawn by Ox.
13. Ala. Picking Cotton. Farm House in Distance.
14. Fla. Cypress Swamp. Long Moss Hanging from Trees.
15. Fla. Long Beach, Flat and Sandy. Promenaders.
16. Fla. Cocoanut Trees. Houses.
17. Fla. Gathering Oranges. Tall Ladders Set up against Trees.
18. Fla. Pineapple Plantation.
19. Fla. St. Augustine. Old Cathedral from the Plaza.
20. Fla. St. Augustine. Old Slave Market.
21. Fla., Jackson. Interior of Subtropical Building. Typical Products on Exhibition.
22. Fla., Key West. Weighing Turtles.
23. Ga., Thomasville. Typical Southern Negro, Cart and Mule.
24. Ga. Ox-Cart. Old Colored Man Driving.
25. Ga. Group of Colored Children in Field.
26. S. C., Charleston. City Hall.

LESSON **1608.**

FLORIDA.

1. St. Augustine, Fla. View from Harbor.
2. St. Augustine, Fla. Boats at Pier.
3. St. Augustine, Fla. Boats Racing.
4. St. Augustine, Fla. Hotel Ponce de Leon.
5. St. Augustine, Fla. Hotel Ponce de Leon.
6. St. Augustine, Fla. Hotel Ponce de Leon. Interior Entrance.
7. St. Augustine, Fla. Oldest Church.
8. St. Augustine, Fla. Oldest House.
9. St. Augustine, Fla. Hotel Alcazar.
10. Lake Worth, Fla. Palms.
11. Lake Worth, Fla. Palm Grove.
12. Lake Worth, Fla. Palms and Sea
13. Lake Worth, Fla. Garden in Front of Hotel.
14. Jacksonville, Fla. Yacht Talisman.

LESSON **1609.**

CITY OF ST. LOUIS.

1. Map of St. Louis and Suburbs. Illinois Shore—East St. Louis, Madison, etc.
2. Panorama of St. Louis, Looking West. Custom-House in Distance.
3. Eads Bridge and Levee. Wharf Boat. Steamer Loading. Merchandise on Bank.
4. Ferry Boat on the Mississippi.
5. Old French Quarter. Broadway Cable Car.
6. Planters Hotel. Exterior.
7. Republic Building. Exterior.
8. Lafayette Park Methodist Church.
9. Olive Street, Looking East, Century Building, Custom House, Chemical Building, Odd Fellows Building.

10. Post Office or Custom House and Chemical Building.
11. Exposition Building. Exterior.
12. City Hall. Exterior.
13. Museum of Fine Arts. Exterior.
14. Union Station. Exterior.
15. Interior of Union Station. Waiting Room.
16. Interior of Shoe Factory. Men at Work.
17. Early Settler's House. Stood on 3rd and Plum Sts.
18. Lucas Place, Looking East from Jefferson Avenue, North Side of Street.
19. Residence, Lindell Boulevard and King's Highway.
20. Central Y. M. C. A. Building. Grand and Franklin Aves.
21. High School. Grand Ave.
22. High School. Botany Room.
23. Fremont School. Natural History Cabinet.
24. Columbia School. Domestic Science, Cooking.
25. Columbia School. Manual Training Room.
26. Mullanphy Hospital, Garrison and Montgomery Sts.
27. Work House Quarry, South St. Louis.
28. Shaw's Garden. Flower Beds.
29. Shaw's Garden. Lily Pond. Hot Houses in Background.
30. Forest Park Entrance. Statue of Frank P. Blair.
31. Forest Park. Winter. Pagoda. Snow on Ground.

WASHINGTON UNIVERSITY.

32. Administration Building.
33. Hall of Congresses.
34. Cloister of Hall of Congresses.
35. Dormitory Building for Entertainment.
36. Minor Entrance of Entertainment Building.
37. College Dormitory.

LESSON 1610.

HISTORY OF ST. LOUIS.

1. Ferdinand DeSoto—Discoverer of the Mississippi.
2. Robert Cavalier de La Salle.
3. Father Marquette at St. Ignace—1670.
4. St. Louis, Missouri as Trading Post in 1765.
5. Fort St. Charles—1776.
6. Pierre Chouteau's House—1785.
7. Chouteau Pond, Site of Present Union Station.
8. First Postoffice in St. Louis—1798.
9. Thomas Jefferson.
10. Napoleon Bonaparte.
11. James Monroe—Special Envoy to Paris—1803.
12. Map of Louisiana Purchase and Statistics.
13. Map of United States and Louisiana Purchase.
14. First Government House of Upper Louisiana.
15. River Front St. Louis—1840.
16. Mississippi River in Midwinter 20° below zero.
17. Scene on the Mississippi River.
18. Osceola Bar, Mississippi River, Mattress Ballasted Ready for Sinking.
19. Entrance to Tunnel—St. Louis.
20. Union Station—St. Louis.
21. New City Hall—St. Louis.
22. Court House, St. Louis, Mo.
23. First Catholic Church in St. Louis.
24. Second Catholic Church in St. Louis.
25. Walnut Street Cathedral St Louis.
26. Map of St. Louis County.
27. Panorama of St. Louis.
28. Avenue through Wilderness—(World's Fair Site.)
29. Forest Park in Winter.
30. Bates Statue—Forest Park.
31. White Fountain—Forest Park.
32. New Washington University.
33. Shaw's Garden.
34. Mausoleum—Shaw's Garden.
35. Statue of Humboldt — Tower Grove Park.
36. Water Tower—Compton Hill.
37. Panorama of St. Louis, Looking West.
38. Panorama of St. Louis, Looking North.
39. Meramec Highlands, near St. Louis.
40. Meramec River at Crystal Bluffs.
41. Jefferson Barracks.

LESSON **1611.**

LOUISIANA PURCHASE EXPOSITION.

1. Hon. D. R. Francis Driving First Stake at World's Fair, Sep. 3, 1901.
2. World's Fair Map.
3. Inside Inn.
4. From the Center of Transverse Lagoon.
5. A Colonnade of the Education Building.
6. One of the Many Bridges.
7. Palace of Agriculture.
8. Palace of Mines and Metallurgy.
9. East Facade—Machinery Hall.
10. Pennsylvania State Building.
11. Indiana State Building.
12. Washington State Building.
13. Oklahoma Building.
14. Montana Building.

STATUARY AND SCULPTURE.

15. Joliet.
16. De Soto.
17. Physical Liberty.
18. Peace.
19. Spirit of the Pacific Ocean.
20. Progress of Manufacture.
21. Fisheries.
22. Ornamental Group.

LESSONN **1612.**

LOUISIANA PURCHASE EXPOSITION.

1. Map of St. Louis Showing Location of World's Fair.
2. Clearing Forest Park for World's Fair.
3. Exposition Map.
4. Hon. D. R. Francis—President L. P. E.
5. Making New Channel for River des Peres.
6. Main Lagoon. (Excavating.)
7. Splicing Beams for Agricultural Building.
8. Electric Light Generator.
9. From the Top of the Washington Building.
10. From the Steps of the Government Building.
11. East Facade—Varied Industries Building.
12. Philippine Building.
13. North Facade of Agricultural Building.
14. Machinery Hall.
15. Louisiana Purchase Monument.
16. Virginia State Building.
17. New York State Building.
18. Arkansas State Building.
19. South Dakota Building.

LESSON **1613.**

STATUARY AND SCULPTURE. (World's Fair).

1. Livingstone.
2. Laclede.
3. Manufacture.
4. Sioux Chief.
5. Industry.
6. Commerce and Navigation.
7. Music.
9. Group for Side Cascade.
9. Quadriga.
10. Wyoming. (Terrace of States.)
11. Pestalozzi.
12. Transport by Rail.
13. Apollo and the Muses.
14. Power.
15. Spirit of the Atlantic.
16. The Destiny of the Red Man.
17. Cupid and the Fish.
18. Quadriga.
19. Louisiana Purchase Exposition Flag.
20. Swinging Colonnade—Varied Industries Building.
21. Entrance—Palace of Education.
22. Mexican Building.
23. Palace of Electricity.
24. Varied Industries Building.
25. North Facade, Machinery Hall.
26. West Virginia State Building.
27. Connecticut State Building.
28. Louisiana Building.
29. Nevada Building.

LESSON **1614.**

A WALK THROUGH THE PUBLIC SCHOOLS OF ST. LOUIS.

1. Lafayette.
2. Cote Brilliante.
3. Entrance—Blow.
4. Shepard.
5. Clay.
6. Patrick Henry.
7. Meramec.
8. Lyon.
9. Franklin.
10. Humboldt.
11. Ashland.
12. Madison.
13. Gardens—Teachers College.
14. Corridor—Yeatman High.
15. Upper Corridor—Patrick Henry.
16. Sherman Corridor.
17. Portable School Room. Exterior.
18. Portable School Room. Interior.
19. Kindergarten—On Circle—Fanning.
20. Kindergarten—Sherman School.
21. Kindergarten—Columbia School.
22. Kindergarten—Marquette School.
23. Reading — 1st Grade — Fanning.
24. Reading—2nd Grade—Bates.
25. Reading—1st Grade—Carondelet.
26. Arithmetic — 2nd Grade — Fanning.
27. Arithmetic—2nd Grade—Bates.
28. Arithmetic, Measuring — Cote Brilliante.
29. Visit to Blacksmith Shop — Gratiot.
30. Visit to Baker's Shop.
31. Geography—3rd Grade—Pope.
32. Geography—Fremont.
33. Geography—Studying Cotton—Wyman.
34. Nature Study—Using Museum Material—Wyman.
35. Study Hall—Museum.
36. Indian Corner—Museum.
37. Delivery Wagon—Museum.
38. Teacher's Library—Museum.
39. Nature Study—Mann.
40. Nature Study—Hodgen.
41. Cleaning a Lot—Dozier.
42. School Gardening—Field.
43. School Gardening—Roe.
44. Physics—Mann.
45. History—Lincoln.
46. History—Wyman.
47. Reading President's Message—Jefferson.
48. Reference Books.—Hodgen.
49. Lantern Drawing—Emerson.
50. Drawing a Pose—7th Grade—Washington.
51. Sketching Animals—Dozier.
52. Sketching Animals—Eliot.
53. Construction Work—Marquette.
54. Construction Work—Arlington.
55. Manual Training—Blair at Columbia.
56. Cooking Class at Columbia.
57. Calisthenics—Field.
58. Club Drill—Field.
59. Boys Gymnasium—Shepard.
60. Girls Gymnasium—Wyman.
61. Calisthenics Drill—Field Day, May 21st, 1910.
62. Races—Field Day, May 21st, 1910.
63. Music—6th Grade—Fremont.
64. Music—Froebel.
65. Greeks—Laclede.
66. Different Nationalities—Laclede.
67. Hungarians—Humboldt.
68. Bohemians—Carroll.
69. Finlanders—Baden.
70. Gypsies—Gratiot.
71. Baths—Jefferson.
72. Waiting for Doors to be Opened—Patrick Henry—Vacation.
73. Wood Carving, Laclede—Vacation.
74. Basket Work—Patrick Henry—Vacation.
75. Games—Patrick Henry—Vacation.
76. Special School No. 1.
77. Assembly Talk—Gallaudet.
78. Geography—Gallaudet.
79. Cooking Class—Industrial.
80. Kindergarten—Banneker.
81. Calisthenics—L'Overture.
82. Arithmetic—Banneker.
83. Dismissal—Wyman.
84. Recess—Oak Hill.
85. Returning from Benton Park—Garfield.
86. Hygiene Department. Examining Throats—Patrick Henry.
87. Reading—Eliot Evening.
88. Arithmetic—Eliot Evening.
89. Drawing—Central High—Evening.
90. Reading—L'Overture Evening.
91. Foreigners — Evening School—Carroll.
92. Mckinley High.

93. Yeatman High.
94. Soldan High.
95. Soldan High.
96. Sumner High.
97. Commercial Room — Central High.
98. Typewriting Room — McKinley High.
99. Biology.—McKinley High.
100. Conservatory—McKinley High.
101. Cooking—McKinley High.
102. Ironing—Yeatman High.
103. Art Room—McKinley High.
104. Metal Work—Yeatman High.
105. Girls Gymnasium — McKinley High.
106. High Hurdle Race—Central High.
107. Lunch Room—Yeatman High.
108. Machine Shop—Sumner High.
109. Cooking—Sumner High.
110. Teachers College.
111. Teachers College—Entrance.
112. Critique Room — Teachers College.

LESSON **1615.**

A TRIP FROM SAN FRANCISCO TO ST. LOUIS.

1. Map of United States (To Locate Places to be Visited).
2. Cal., San Francisco. Panorama.
3. Cal., San Francisco. Panorama.
4. Cal., San Francisco. Palace Hotel.
5. Cal., San Francisco. Seal Rock.
6. Cal., San Francisco. Chinese Quarter.
7. Cal., San Francisco. Interior of Joss House.
8. Cal., Sacramento. Panorama.
9. Cal., Sacramento. State Capitol.
10. Cal., Yosemite Valley. View from Inspiration Point. Mountains in Distance.
11. Cal., Yosemite Valley. Yosemite Falls.
12. Cal., Yosemite Valley. Sentinel Rock.
13. Cal., Mirror Lake. Mountains and Reflection in Water.
14. Cal., Mariposa Grove. Gigantic Redwood Trees.
15. Utah, Ogden. Pacific Railroad. Mountains in Distance.
16. Utah, Salt Lake City. Panorama.
17. Utah, Salt Lake City. Mormon Tabernacle.
18. Utah, Salt Lake City. Mormon Temple.
19. Wyo., Yellowstone Park. Yellowstone Falls.
20. Wyo., Yellowstone Park. Old Faithful Geyser.
21. Wyo., Yellowstone Park. Bee Hive Geyser.
22. Wyo., Yellowstone Park. Pulpit Terraces.
22. Wyo., Indians Preparing for War Dance.
24. Colo. Group of Utes. Wigwam.
25. Colo. Indian, Uncivilized.
26. Colo. Indian. Civilized.
27. Mont. Cow Boys Branding Cattle.
28. Mont. Northern Pacific Railroad. Steam Snow Plow on High Trestle.
29. Colo., Denver. Panorama.
30. Colo., Platte Canon. Irrigating Ditch. Railroad Tracks.
31. Neb., Omaha. Panorama. Missouri River in Distance.
32. Mo., St. Louis. Panorama. River in Distance, Corner of 4th and Market St. in Foreground.
33. Family of Seals.
34. Map of United States, showing Fruit Districts.
35. Mount Shasta from Northwest.

LESSON **1616.**

A TRIP THROUGH COLORADO.

1. Top of Pike's Peak.
2. Near Halfway House—Pike's Peak.
3. Manitou.
4. A Ledge of Hard Rock.—Talus Slope.
5. Burro Trail on Talus Slope.
6. Williams Canyon.—The Narrows.
7. Stage Coach on Mountain Road.
8. Seal and Bear Rock—Worn by Windblown Sand.
9. Vertical Strata.
10. Horizontal and Tilted Strata.
11. Lava Blocks.

12. Mountain Ranges.
13. Mountains.
14. A Granite Chasm—(Water Cut.)
15. Seven Falls—South Cheyenne Canyon. (Water cutting Granite.)
16. Grand River—Colorado—Irrigating Wheel.
17. Grand River, Colorado. Irrigating Wheel, Near View.
18. Mine Dump—Cripple Creek.
19. Mouth of a Mine—Cripple Creek.
20. Capped Rocks—Worn by Windblown Sand.
21. Mineral Palace—Pueblo, Colo.
22. An Arroyo near Pueblo.
23. Balance Rock—Garden of the Gods.
24. Gateway—Garden of the Gods.

LESSON **1617.**

SALT LAKE AND WESTERN TRIP.

1. Salt Lake City. Court House.
2. Salt Lake City. Temple.
3. Salt Lake City. Tabernacle.
4. Salt Lake City. Eagle Gate.
5. Salt Lake City. Beehive.
6. Salt Lake City. Bear and Man.
7. Salt Lake City Bear alone.
8. Cliff Dweller's Canon, Entrance.
9. Cliff Dweller's Canon, Entrance.
10. Cliff Dwelling.
11. Rio Grande—R. R.—Needles.
13. Rio Grande. Royal Gorge.
13. Rio Grande. Royal Gorge.
14. Flagstaff. Team.
15. Washington. Wood and Creek.
16. Washington. Hotel.
17. Washington. Ferns.
18. Banff—Bow River.
19. Banff—Bow River.
20. Banff—Bow River Falls.
21. Banff Hotel.
22. Banff—Church.
23. Banff—Church.
24. Banff—Mountain—Evening.

LESSON **1618.**

SAN FRANCISCO, CALIFORNIA.

1. San Francisco—Court House.
2. San Francisco—Leland Stanford House.
3. San Francisco—Typical Dwelling.
4. San Francisco-Chinatown Gambling Hell.
5. San Francisco — Chinatown — Street Crossing.
6. San Francisco—Chinatown—Restaurant.
7. San Francisco—Chinatown—Grocery.
8. San Francisco—Beach.
9. San Francisco — Children on Beach.
10. San Francisco—Seal Rock.
11. San Francisco—Cliff House and Beach.

LESSON **1619.**

MEXICO AND CENTRAL AMERICA.

1. Map. (To Locate Places to be Visited.) Mexico.
2. Orizaba. A Picturesque Street. One Story Houses with Projecting Tiled Roofs.
3. City of Mexico. Market Day. Street Scene. Broad Brimmed Hats in Foreground for Sale. Women with Shawls on Their Heads.
4. City of Mexico. Typical Residence. Two Stories, Large Windows, Awnings.
5. City of Mexico. Interior of a Spanish Residence of the Wealthy Class. Rich Hangings, Rugs, Glass Doors Opening on Veranda.
6. City of Mexico. Plaza Guadeloupe. Avenue of Shade Trees. Fountain.
7. City of Mexico. Promenaders in the Alameda.
8. City of Mexico. Interior of Cathedral. Altar and Onyx Pulpit.
9. City of Mexico. Aqueduct and Fountain Built by Cortez. Natives.
10. City of Mexico. Aztec Calender Stone.
11. City of Mexico. Natives on the

Chinampas or Floating Gardens. Peculiar Canoes.

12. Maguey Plant. Peon Sucking Pulque.

13. City of Mexico. A Pulque Shop.

14. Chapultepec. Castle on Hill Top. Cattle Grazing.

15. Cholula Aztec Pyramid. Church on Summit. Garden in Foreground.

16. San Juan. Pyramid of the Sun. Overgrown with Vegetation.

17. Pueblo. Panorama. Popocatepetl in Distance.

18. Pueblo. Carved Front of a Church.

19. Cordova. Coffee Burros Laden.

20. Guanajuato. Grinding Silver Ore. Very Primitive Machinery. Horse Pulls Wheel Around in Circular Trough.

21. Atoto. Typical Hacienda or Large Estate. Strongly Walled. Pulque Plants.

22. Leon. Natives Plowing with Oxen.

23. Toluca. Indians, Boy with Baby on His Back Receiving Alms. Rude Dwelling made of Boards.

24. City of Mexico. Chinampas or Floating Gardens. Native Hut. Walls Made of Rushes. Thatched Roof. Native Child.

25. Yucatan. Tropical Scenery. Huts with Thatched Roofs. Bay in Distance.

CENTRAL AMERICA.

26. Honduras. Railway through Jungle. Hand Car.

27. Costa Rica. Forest, Showing Ferns and Parasites.

28. Costa Rica. Native Women Grinding Meal with Large Stone.

29. Costa Rica. Loading Bananas on Railroad Cars. Banana Forest in Background.

30. Panama. View on the Canal. Shelved Bank, Showing Successive Stages of Work. Machinery and Railroad Track. Small Streams of Water.

31. Panama. View of Completed Section of Canal, West of Colon. Boat, Broad Stream of Water. Palm Shaded Buildings of Ancon Hospital, Panama.

LESSON 1620.

WEST INDIES.

1. Map. (To Locate Places to be Visited.)

2. Cuba, Havana. Ship Entering Harbor. Punta and Morro Castle.

3. Cuba, Havana. Cabanas Castle. Entrance to Harbor.

4. Cuba, Havana. Cathedral. Exterior.

5. Cuba, Havana. Captain General's Palace. View in Summer.

6. Cuba, Havana. Building. Typical Cuban Architecture, Colonnade Style.

7. Cuba, Havana. Columbus Memorial Chapel. Donkey and Cart in Foreground.

8. Cuba, Havana. Bull Ring. Exterior.

9. Cuba, Havana. Avenue of Royal Palms. Botanical Gardens.

10. Cuba. Covered Cart Drawn by Four Oxen. Native Driving.

11. Cuba. A Sugar Factory on Plantation. Ox Carts. Large Smoke Stack and Sheds.

12. Cuba. Tobacco Plantation. Men at Work in Fields. House with Thatched Roof and Sides in Background.

13. Cuba, Santiago. Tree under which Surrender Took Place.

14. Cuba, Santiago. Wreck of Cervera's Fleet. "Oquendo" and "Maria Teresa" Burning on the Beach off Santiago, July 3rd, 1898.

15. Porto Rico, San Juan. Sea Wall. Buildings in Distance.

16. Porto Rico, San Juan. Plaza and Municipal Building.

17. Porto Rico, San Juan, Spanish Troops Evacuating San Juan.

18. Barbados. Windmill.

19. Martinique. A Street in St. Pierre. Natives.

20. Martinique. Native Divers in Boats. Ships in the Distance.

21. St. Croix. Palm Tree Crushed to Death Inside a Growing Fig Tree. Illustrates Luxuriance of Vegetation.

22. Jamaica, St. Lucia. On the Coal Wharf. Ship Anchored at Wharf. Colored Natives.

23. Jamaica On the Bog Walk Drive. Typical Scenery. Arched Bridge.

24. Jamaica, Kingston. Road Through the Cacti. Natives.

25. Jamaica, Kingston. Jerusalem Candle-stick Tree.

26. Jamaica. Lily Pond. Palms in Background. Castle in Gardens.

LESSON **1621.**

HAWAII.

1. Hula Girls with Drums.
2. Hula Dancers at the King's Coronation.
3. Hula Girls with Guitars.
4. St. Louis College, Honolulu.
5. Cocoa Palm Grove at Waikiki.
6. Diamond Head.
7. Warships in Honolulu Harbor.
8. Choir of Leper Girls.
9. Father Damien on his Deathbed.
10. Aiguillo in Ias Valley.
11. Cutting Sugar Cane.
12. Field of Growing Cane.
13. Interior of Boiling House of Sugar Mills.
14. Waipio Falls, Hawaii.
15. Lava Flow near Hilo.
16. Hilanea Iki Volcano, Hawaii.

LESSON **1622.**

AMERICAN ARCTIC EXPEDITION.

SEARCH FOR REMAINS OF DR. JOHN FRANKLIN.

1. The Franklin Search Expedition. View in the Frozen North.
2. Map. Region Explored.
3. Adapting His Party to Eskimo Life. Sun. Low Houses of Ice. Sled Drawn by Dogs.
4. Astonishing the Natives. Group of Eskimos Looking at Illustrated Newspaper.
5. The Halt at Noon. Men and Dogs Resting. Provisions and Canoe Carried on Sleds.
6. Down Hill. Loaded Sleds Sliding Down Hill, Men Guiding them with Sticks, Pack of Dogs, Unhitched, Running.
7. Hay's River, Big Bend. Open Polar Sea. Houses of Ice. Explorers' Camp. Dogs.
8. A Reindeer Hunt. Men in Canoes Pursuing Reindeer, Man Carrying Canoe.
9. Catching Salmon at Salmon Creek. Men Spearing Fish.
10. The Midnight Sun. Group of Explorers and Guides Near Houses. Men Crawling from their Houses. Sleds and Dogs.
11. The Breaking up of the Ice. Man on Large Cake of Ice.
12. A Summer View in the Arctic Region. Sparse Vegetation in Foreground.
13. A Summer View. King William's Land. Sparse Vegetation.
14. Finding the Grave of Lieut. Irving. Skeleton Unearthed.
15. Monument of Stones Erected over Irving's Grave.
16. View of Reindeer Camp. Skins Spread on Ground. Antlers on Top of Houses.
17. Monument at Starvation Cove. A Rude Cross.
18. Crossing Simpson's Strait. Men and Dogs on Canoes Fastened Side by Side. Auks on Ice in Distance.
19. Burial of Lieut. Irving's Remains. After Return of the Explorers.
20. Sir John Franklin's Monument.

LESSON **1623.**

GREENLAND'S ICY MOUNTAINS, OR WHALING IN THE ARCTIC REGIONS

1. Map of Arctic Region.
2. Introductory. Nine Typical Scenes in Greenland. Eskimos, Eskimo Dogs, Young Polar Bear, Ship Caught in Ice, etc.
3. Ship with Sails Spread Caught in Young Ice.
4. Ship Fast to Land Ice. Panorama of Arctic Sea.
5. Dalrymple Rock. Promontory on Coast of Greenland.
6. Upernevik, Northernmost Danish settlement in Greenland. Church. Houses.
7. A visit from the Danish Governor and His Wife on Board Ship. Captain of Whaling Expedition Standing near them. Machinery of Ship in Background.
8. Group of Eskimo Women and Children on Deck of Ship.
9. Two Eskimos, Man and Woman, on Ship.
10. "Kate Mackay," Eskimo Girl.

11. An Eskimo Encampment. Tents Made of Skins.
12. An Omiak or Woman's Boat. Differs from Kyak or Man's Boat in Size and Capacity.
13. Eagle's Nest in Icy Crag of Mountain. Two Eggs in Nest.
14. Harpoons.
15. Spanning. Attaching Harpoon to Rope.
16. Whale Landed. Group of Men. Mountains in Distance.
17. Whale Bone Taken from Upper Jaw of Whale. Scene on Deck.
18. Group on Deck. Whale's Lip Fastened to Mast.
19. Ship in Melville Bay. Homeward Bound.

LESSON **1624.**

SOUTH AMERICA.

1. Map in Relief. Principal Natural Features, Rivers, Mountains, etc.
2. Map. Locate Places to be Visited.
3. Brazil, Rio Janeiro. Statue of Dom Pedro I.
4. Brazil, Santarem Chute for Sugar Cane. Natives Arranging Cane in Regular Piles.
5. Brazil. Banana Plantation. Farm House in Distance.
6. Brazil. Houses on Amazon, Thatched Roof. Native Indians. Large Round Flat Trough in Foreground.
7. Bolivia, Lake Titicaca. Pebbly Beach. Canoes. Andes Mountains in Distance.
8. Bolivia, La Paz. Municipal Palace. Exterior.
9. Bolivia. Indian Cart Drawn by Oxen Crossing the Mountains near La Paz.
10. Bolivia, Tiahuanuco. Ruin of an Inca Palace. Massive Masonry. Native Woman on Left.
11. Argentine Republic. Pampas. Mountains in the Distance.
12. Argentine Republic, Buenos Ayres. Government Building. Exterior. Street Torn up in Foreground.
13. Argentine Republic, Buenos Ayres. Milk Carrier Mounted on Horse. One Story Shops in Background with Signs in Spanish.
14. Chile. The High Andes. Grand View. Patches of Snow.
15. Chile. Andes Mountains. Glaciers.
16. Chile, Santiago. View in Park. Tropical Foliage. Lake. Bridge.
17. Chile, Santiago, Cathedral, Interior. Beautiful Slender Columns. Altar.
18. Peru, Lima. Cathedral from the Plaza.
19. Peru, Lima. Statue of Bolivar. Park Grounds.
20. Peru, Puno. Carnival Time. Indians with Llamas. Offering Wares for Sale. Beautiful Building with Arched Colonnade in Background.
21. Peru. Group of Llamas Resting. Stables on Right. Mountains in Distance.
22. Ecuador. Mount Chimborazo, Snow-covered.
23. Ecuador. Cordilleras. Tropical Forest.
24. Ecuador, Bodegas. Washerwomen Washing on Bank of Stream. Long One Story Building on Top of Bank.
25. Ecuador. Native Funeral Procession. Priest and Acolytes. Mourners. Pall Bearers.
26. U. S. of Columbia. Bamboo Hotel. Exterior. Donkey Dragging Bamboo Poles.
27. Dutch Guiana. Creole Girl. Elaborate Head Dress. Jewelry. Embroidered Robe. Negro Type.

LESSON **1625.**

A TRIP TO EUROPE. No. 1.

1. Map of Europe. (To Locate Places to be Visited.)
2. Sunset on the Atlantic. Mid-ocean. Bowsprit of Steamer on Right
3. Ireland. Giant's Causeway. Basaltic Columns. Mountains and Cottage in Distance.
4. Ireland. Blarney Castle.
5. Scotland, Staffa. Fingal's Cave.
6. Scotland. Stirling Castle.

7. England, London Tower. River Thames in Foreground. Boats and Barges.

8. England. Houses of Parliament. Thames River in Foreground.

9. England, Westminster Abbey from North, Showing Rear and Side.

10. Map. (To Locate Places to be Visited).

11. France. Panorama of Paris, Seine River Crossed by Seven Bridges. Eiffel Tower in Distance. Louvre and Quay in Foreground.

12. France, Paris. Cathedral of Notre Dame, Rear and South Side. Seine River in Foreground.

13. France, Paris. Hotel des Invalides. Exterior.

14. France, Paris. Hotel des Invalides, Interior. Tomb of Napoleon I.

15. France, Paris. Arc de Triomphe.

16. Switzerland. Lake Geneva. Castle of Chillon.

17. Belgium, Brussels. Hotel de Ville. (Town Hall.)

18. Holland, Rotterdam. Windmill on the Canal.

19. Holland. A North Holland Dog Cart.

20. Germany. The Rhine. Cathedral of Cologne, from South.

21. Germany. The Rhine. Oberwesel. Schonburg Castle.

22. Germany, Nuremberg. Old Houses on the Pegnitz River.

23. Germany, Berlin. Unter den Linden Strasse. Statue of Frederick the Great. Royal Palace on Left. Arsenal on Right.

24. Denmark, Copenhagen. Public Square. Royal Theater.

25. Sweden, Stockholm. Panorama Quay.

26. Russia, Finland. Hut and Peasants.

27. Russia, St. Petersburg. Winter Palace. Admiralty Place.

28. Austria, Vienna. Panorama. St. Stephen's Cathedral.

29. Italy, Venice. Panorama. Doge's Palace. Domes and Campanile of St. Mark's Church. Grand Canal.

30. Italy, Florence. Panorama. Cathedral and Giotto's Tower. Santa Croce on Right. Arno River in Foreground.

31. Italy, Rome. St. Peter's and the Vatican. Exterior. Obelisk. Fountain Playing.

LESSON **1626.**

A TRIP TO EUROPE. No. 2.

1. Niagara Falls.

2. Among the Thousand Islands, St. Lawrence River.

3. Quebec, Canada.

4. One of the Large Ocean Liners.

5. The Approach to Glasgow (moonlight.)

6. The Falls of Inversnaid, Scotland.

7. Scott's Monument. Edinburg, Scotland.

8. Stranaheler Hotel, Scotland.

9. Church where the Remains of Shakespeare are Buried. Stratford.

10. Castle Warwick — from Old Bridge, Stratford, England.

11. Castle Warwick—Close View—England.

12. Typical Street Scene—Stores and Houses of Chester, England.

13. Interior of Old Cathedral, Chester, England.

14. Westminster Abbey, London.

15. Albert Music Hall, London.

16. Opera House—Brussels, Belgium.

17. View of Cologne, Germany.

18. Cathedral of Cologne, Germany.

19. Excursion Boat on the Rhine.

20. Castle Drachenfels, on the Rhine. Property of the King of Sweden.

21. Lorelei Height, on the Rhine.

22. Dog-cart on the Street of Mains—Germany.

23. View from Pier at Zurich—Switzerland.

24. Quaint Street of Zurich, Switzerland.

25. Unrestored Tower of the Schloss at Heidelberg, Germany.

26. Part of the old Schloss at Heidelberg Rebuilt, Germany.

27. Mountains Viewed from Lake Lucerne.

28. Hotel near Railway Station, Lucerne.

29. Tunnel on Railway to Lausanne.

30. Swiss Hotel at base of Swiss Mountains.

31. Waterfall at Thunersee, Interlaken, Switzerland.

32. Grand Opera Building and Art Museum. Geneva.

33. Rousseau's Island, Geneva.

34. Lake Scene with Sailboats, Geneva.

35. Typical Avenue of Paris, France

36. Paris Opera House, France.

37. Eiffel Tower—view from Trocodero Hotel, Paris.

38. River Seine, Paris, France.

LESSON 1627.

ENGLAND AND WALES. No. 1.

1. Cornwall. "Armed Knights." (Rocks.) Land's End.
2. Liverpool. The Docks. Tug in Foreground. Warehouses, Wharf, Ships in Distance.
3. Black Friar's Bridge.
4. London—Omnibus.
5. London—Tower of London.
6. Tower of London.
7. London. Houses of Parliament. Exterior. Thames River in Foreground.
8. London. House of Commons. Interior. From Gallery Looking towards Speaker's Chair.
9. London. Westminster Abbey.
10. London. Westminster Abbey. Interior. Nave. Choir Screen.
11. London. St. Pauls. Interior.
12. York. Minster, Interior.
13. London Horse Guards.
14. London. A University Boat Race on the Thames. Bridge Crowded with People.
15. Warwick Castle. River Front and Mill in Foreground.
16. Oxford. High Street. University College on Left. All Soul's College on Right. Beyond Latter is St. Mary's Church. In the Distance, All Saints Church.
17. Durham Cathedral from Opposite Bank, Winter.
18. Stratford-on-Avon. Shakespeare's House on Left.
19. Mount Snowdon. Lake in Foreground.
20. Old Welsh Woman Taking Her Afternoon Tea Out of Doors. Picturesque Costume. High Hat.

LESSON 1628.

ENGLAND AND WALES. No. 2.

1. Liverpool Shipping.
2. Southampton. Landing Freight.
3. London Bridge. Monument in Commemoration of Great Fire in Distance.
4. London. A London Omnibus Loaded.
5. London. Tower of London. Inscriptions in Beauchamp Tower.
6. Houses of Parliament.
7. London. House of Peers. Interior. From Gallery Looking towards Speaker's Chair (Woolsack.) Paintings.
8. London. Trafalgar Square from National Gallery. Nelson Monument. Clock Tower of Houses of Parliament in Distance.
9. London. Westminster Abbey. Exterior. Front and Side.
10. London. St. Paul's Cathedral. Houses in Foreground.
11. Canterbury Cathedral. Interior.
12. London. Hyde Park in Season. Pedestrians. Carriages. Houses in Distance.
13. London. Mounting Guard.
14. Windsor Castle. Thames River in Foreground. Row Boats.
15. Kenilworth Castle from Bridge. Ivy Covered Ruins.
16. Tintern Abbey. Ivy Covered Ruins.
17. Brighton. On the Beach. People Lounging. Sail Boats. Bath Houses on Wheels.
18. Salisbury Plain. Wiltshire. Stonehenge. Druidical Stones.
19. Conway Castle, from South.

LESSON 1629.

SCOTLAND AND IRELAND.

IRELAND.

1. Map of Ireland (To Locate Places to be Visited).
2. Cork. South Mall. Street with Buildings.
3. Killarney. Upper Lake from Kenmare Road.
4. New Ross Co. Cattle Fair. Village Street.
5. Killarney Co. Piling Peat.
6. Tipperary. A "Small Holding." Small Stone House with Thatched Roof.

7. Donegal Co. Woman Washing by the River. Typical Scenery.

8. Dublin. O'Connel (Sackville) Street. Monument to O'Connell, beyond Latter is Monument to Sir John Gray and Nelson Column. Building with Colonnade in front is the Post office.

9. Queenstown. Jaunting Car. Buildings in Background.

10. Belfast. Hand-loom. Used in Manufacture of Linen.

11. Giant's Causeway. Peasant Woman Sitting on Rock Called "The Wishing Chair." Hexagonal Formation of Rocks.

SCOTLAND.

12. Map of Scotland. (Locate Places to be Visited.)

13. Glasgow. The University. Lake and Trees in Foreground.

14. Melrose Abbey. Ruins. Tombstones with Inscriptions in Foreground.

15. Edinburgh Castle from Grassmarket Castle on Highland. Shops Below.

16. Abbotsford. Garden Front. Home of Sir Walter Scott.

17. Ayr, Alloway. Burns' Cottage.

18. Loch Lomond. Mountains in Distance.

19. Trossachs. Stone Cottages with Thatched Roofs.

20. Kitchen of Highland Cottage. Fire-place, Cupboard, etc.

21. Highlanders Dancing in Costume.

22. An Aberdeen Fishwife.

23. Hebrides Islands. Skye Crofter. Grinding Corn. Rude Stone Huts Thatched.

24. Hebrides Islands. Skye Crofter Planting Potatoes. Village in Distance.

25. Inversnaid Falls. Bridge over Falls.

26. Argyleshire. Castle Stalker. Beautiful Cloud Effect.

27. Island of Staffa. Fingal's Cave.

LESSON **1630.**

SPAIN AND PORTUGAL.

1. Map. (To Locate Places to be Visited.)

PORTUGAL.

2. General View of Lisbon and Harbor.

3. Cintra. Castle of Pegna.

4. Belem. Court of the Cloister. Garden and Richly Carved Arches and Columns.

5. Cintra. Moorish Castle Ruins.

SPAIN.

6. Cadiz. The Harbor. View of City.

7. Rock of Gibraltar from the North. Neutral Ground.

8. Gibraltar from Old Mole. Cannon in Foreground.

9. Gibraltar. The Signal Station. Talus.

10. Ceuta, from the Signal Station.

11. Granada. Panorama of The Alhambra and its Gardens.

12. Granada. The Alhambra. Interior Hall of Ambassadors.

13. Granada. The Alhambra. Fountain and Court of Lions.

14. Granada. Tomb of Ferdinand and Isabella.

15. Granada. Gipsy Prince.

16. Seville. General View of the Cathedral. Tower of Giralda.

17. Seville. Alcazar Interior. Hall of Repose. Arabesques on Wall. Beautiful Arches.

18. Seville. Procession in Holy Week.

19. Cordova. Cathedral. Interior of Choir.

20. Old Moorish House. Interior. Courtyard. Fountain in Center. Moorish Arches.

21. Farming Steam Harvesting Machine. Hay Wagon Drawn by Oxen. Water Cart and Donkey, Peasants.

22. Madrid. Royal Palace. Exterior.

23. Madrid. Art Museum. Exterior.

24. Palace of the Escurial. Exterior.

25. Palace of the Escurial. Interior. Hall of Battles.

26. Interior of Bull Ring. Bull Fight.

27. Seville. Bull Fighters in Costume.

28. Destruction of Cervera's Fleet.

LESSON 1631.

FRANCE.

1. Map. (To Locate Places to be Visited).
2. Harbor of Dieppe. Sail and Row Boats.
3. Rouen. The Quay. Principal Churches in Distance.
4. Rouen. Large Clock.
5. Paris. Place de la Concorde. Obelisk in Center. The Madeleine in Distance.
6. Paris. Church of the Madeleine. Front and Side.
7. Paris. Cathedral of Notre Dame. Facade.
8. Paris. Cathedral of Notre Dame. Interior from Choir. Carved Wood Choir Stalls.
9. Paris. The Louvre. Exterior.
10. Paris. The Louvre. Gallery of Apollo. Interior.
11. Paris. The Louvre. Grand Gallery. Artist's Easels.
12. Paris. Palace of the Trocadero from E. Bridge. Soldiers Marching in Foreground.
13. Paris. The Conciergerie. Interior. Prison of Marie Antoinette. Altar.
14. Paris. Cemetery of Picpus. Tomb of Lafayette. U. S. Flag Floating over It.
15. Paris. Flower Market. Among the Roses.
16. Versailles. The Palace. Hall of Battles. Interior.
17. Versailles. The Palace. West Side of Royal Court.
18. Mont St. Michel and Abbey from Southeast.
19. Mont St. Michel. Outer Gateway.
20. Domremy. Home of Joan of Arc. Exterior.
21. Castle of Pierrefonds, near the Lake.
22. Trouville. On the Sand. Bathhouses on Wheels, Tents, Awnings, etc.
23. Grasse. Fish Market. Narrow Street with Buildings.
24. Grasse. Carnival Procession. Decorated Wagons.
25. Guibray. Horse Fair. Village Church in Distance.
26. Nice. Washing Clothes on the Banks of the Paillon. Quay. Bridge. Buildings.
27. Monaco. Casino of Monte Carlo. Avenue of Palms. Flower Beds.
28. Lyons. Place Bellecour. Church in Distance on Height.
29. Marseilles. Panorama. Harbor.
30. French Africa. Algiers from the Admiralty.
31. French Africa, Algeria. Arab Chief and Tribesman.
32. French Africa. Algiers. Native Soldier.
33. Church of the Invalides. Exterior.
34. Tomb of Napoleon. Invalides, Paris.
35. Cathedal of Notre Dame—Paris.

LESSON 1632.

PARIS—FRANCE.

1. Paris. View from Seven Bridges.
2. Paris. Exposition. Place Concorde.
3. Paris. Luxemburg Palace.
4. Paris. Palais de Justice.
5. Paris Omnibus.
6. Paris. Porte S. Martin.
7. Paris. Trocadero.
8. Paris. Fountain of Katherine Medici.
9. Paris. Art Palace.
10. Paris Exposition. Art Palace.
11. Paris. Eiffel Tower.
12. Paris. View from Eiffel Tower, North.
13. Paris. View from Eiffel Tower, South.
14. Paris. Swiss Restaurant.
15. Paris Exposition. Chateau d'Eau.
16. Paris Exposition. Tunis Coffee House.
17. Paris. Entrance to German Marine Exhibit.
18. Paris. Entrance to Forestry Exhibit.

LESSON **1633.**

GERMANY

1. Map. (To Locate Place to be Visited.)
2. Hamburg. Docks. River Elbe in Foreground. Boats. Buildings.
3. Hamburg. Fish Market. Buildings in Distance.
4. Berlin. Royal Palace. Statue of the Great Prince Elector (by Schluter) in the Foreground.
5. Berlin. Royal Theater. Garden. Fountain in Foreground.
6. Berlin. (Reichstag) House of Representatives. Front View with Shrubbery and Fountain.
7. Berlin. The Cathedral. Street Scene.
8. Berlin. Parade of a Regiment of Lancers.
9. Sculpture Group — Exchange Building, Berlin.
10. Neptune's Fountain—Berlin.
11. Gadeustedt's House—Berlin.
12. Leipsic. University and Library. Exterior.
13. Eisenach. Wartburg Castle. Forest in Foreground.
14. Dresden. View up the Elbe. Cultivated Banks. Bluffs Beyond.
15. Dresden. Old Market Place. Church. Statue in Foreground.
16. Halberstadt. Curious Old Houses. Steep Tiled Roofs. Projecting Upper Stories.
17. Nuremberg. Fountain of the Armored Man.
18. Munich. The State House. Exterior. Gothic Style.
19. Bavarian Fisherman's Cottage. Exterior. Dip Nets Hanging up. Plants in Windows.
20. Bavarian Peasant Woman. Lake and Mountains in Background. Barges.
21. Oberammergau. Village. Mountains in Background.
22. Oberammergau. Tourists Proceeding to Theater to Witness Passion Play.
23. Oberammergau. Scene from Passion Play. "The Crowning with Thorns."
24. Strassburg.
25. Strassburg. Storks and Nest. Nest Built on Top of Chimney. Steep Roofed Houses.
26. Worms. The Cathedral. Exterior.
27. Heidelberg. Panorama. Castle of Heidelberg and Surrounding Forest.
28. Heidelberg.
29. Bingen. Village on Rhine River. Opposite Bank Covered with Vineyards.
30. The Nierderwald Denkmal. National Monument on the Rhine opposite Bingen.
31. Castle of Rheinstein on the Rhine Mountains opposite.
32. City Hall—Lubeck.
33. Leibnitz Haus—Hanover.
34. Old German Home—Hildesheim.
35. Elms.

LESSON **1634.**

NORTH CENTRAL GERMANY.

1. Berlin. Brandenburg Gate.
2. Berlin. Mausoleum of Queen Louise.
3. Berlin. Statue of Queen Louise.
4. Berlin. Statue of Goethe.
5. Berlin. Statue of Schiller.
6. Kissingen. Public Garden.
7. Kissingen. Bodenlinden and Tree.
8. Kissingen. Calvary Mountain.
9. Kissingen. Statue Louis I.
10. Kissingen. Church.
11. Kissingen. Scale and Steamer.
12. Germany. Eisenach, Gate and Tower.
13. Eisenach. Ducal Palace.
14. Eisenach. Luther's House.
15. Germany. Wartburg.
16. Germany. Niederwald Monument.
17. Heidelberg. Heinrichsbau.
18. Heidelberg. Heinrichsbau and Column.
19. Heidelberg. Friedrichsbau.
20. Cologne. General View.
21. Cologne. Cathedral from River.
22. Cologne. Architectural Detail.

LESSON **1635.**

SOUTH CENTRAL GERMANY.

1. Frankfort am Main. Eschenheimer Tower.
2. Frankfort a M. Eschenh. Warte.
3. Frankfort a M. Kaiserstrasse and Fountain.
4. Frankfort a M. Eschenheimer Tower.
5. Frankfort a M. Roemer.
6. Frankfort a M. Leonhards Church.
7. Frankfort a M. Liebfrauenberg.
8. Frankfort a M. Leonhards Tower.
9. Frankfort a M. Theatre.
10. Frankfort a M. Goethe Statue.
11. Frankfort a M. House 39 Eschenheimer St.
12. Nuremberg. Tower and Fortifications.
13. Nuremberg. Round Tower.
14. Nuremberg. Old House and Fortifications.
15. Nuremberg. Hans Sachs Monument.
16. Nuremberg. Bridge and Pognitz.
17. Nuremberg. Modern Large House.
18. Nuremberg. Synagogue.
19. Nuremberg. Church.
20. Darmstadt. White Tower.
21. Darmstadt. Ludwig's Monument.
22. Darmstadt. Soldiers' Monument.

LESSON **1636.**

SOUTHERN GERMANY.

1. Munich. Square.
2. Munich. Europa Fountain.
3. Munich. Picture Gallery — Pinakethek.
4. Munich. Sculpture Gallery—Clytethek.
5. Munich. Fountain.
6. Garmisch. Partnach Klamm.
7. Garmisch. Church and Street.
8. Garmisch. Badersee.
9. Lake Constance. Council Hall.
10. Lake Constance. Linden View from Lake.
11. Munich. Square.
12. Munich. Ludwig's Church.
13. Munich. Woodchopping.
14. Munich. Town Hall.
15. Munich. Statue of Bavaria.
16. Munich. Monument Maximillian II.
17. Garmisch. Fountain.
18. Lindau. Gate and Tower.
19. Lake Constance. Church.
20. Oberammergau. Theatre.
21. Oberammergau. Crown of Thorns.
22. Oberammergau. Crucifixion.
23. Strassburg. Imperial Palace.
24. Strassburg. Guttenberg's House.

LESSON **1637.**

AUSTRIA.

1. Vienna. Paliament Building.
2. Vienna. Culture Museum.
3. Vienna. Franz Joseph Fountain and Monument.
4. Vienna. Statue in Hofburg.
5. Vienna. Statue Maria Theresa.
6. Salzburg. House, Swiss Style.
7. Salzburg. Statue of Mozart.
8. Salzburg—from River.
9. Salzburg. Fountain.
10. Tirol. Bluman Station.
11. Tirol. Ims House.
12. Tirol. Castle Fernestein.
13. Tirol. Fountain on Road Side.
14. Tirol. Innsbruck Market.
15. Tirol. Innsbruck, Golden Dachel.
16. Tirol. Innsbruck Hotels from R. R. Station.

LESSON **1638.**

SWITZERLAND.—No. 1.

1. Schaffhausen. Falls of Rhine and Boats.
2. Schaffhausen.
3. Schaffhausen. Showing Bridge.
4. Schaffhausen. Fountain and Street.
5. Brienz.
6. Luzern. Distant View.
7. Interlaken. Old House near Aar.
8. Switzerland. "Schinige Platte."
9. Jungfrau. From Hotel Jungfrau, Wengernalp.
10. Jungfrau. From Kl. Scheidegg.
11. Luzern. Lion.
12. Jungfrau and Pavilion from Muerren.
13. Switzerland. Rest at Trelechant.
14. Switzerland. Breithorn from Gornergrat.
15. Switzerland. Mente Resa near Lyskam from Gornergrat.
16. Switzerland. Treumelbach Falls.
17. Switzerland. Street in Chamonix.
18. Switzerland. Chamonix Church.
19. Switzerland. Aiguille.
20. Switzerland. Mer de Glace and Aiguille.
21. Switzerland. Mer de Glace.
22. Switzerland. Mer de Glace.

LESSON **1639.**

A TRIP THROUGH SWITZERLAND.—No. 2.

1. Map of Switzerland.
2. Train Leaving Witznau.
3. Train Traversing Bridge.
4. Castle of Chillon—Lake Geneva.
5. First Peep at Mont Blanc.
6. Chamaunix and Mont Brevant.
7. Zermatt and Matterhorn.
8. Mer de Glace—From the Flegere.
9. Mer de Glace.
10. Mer de Glace.
11. Lucerne—(Church of the Court.)
12. Lucerne and Pilatus.
13. Lake of Lucerne—Tell's Chapel.
14. Lake of Lucerne—The Axenstrasse.
15. Interlaken—View at the Rugeu.
16. Interlaken—Hotel Beau Rivage.
17. Dome de Goutez—Glacier des Bossous.
18. Stalactites—Glacier du Rhone.
19. Lausanne—Castle and Cathedral.
20. Basel—The Upper Bridge.
21. Basel—Cathedral.
22. Grindelwald—The Matterhorn.
23. View at Murren.
24. St. Gotthard—Devil's Bridge.
25. Hospice St. Bernard.
26. Rosenhain.
27. Swiss Village.
28. Melting Glaciers.
29. The Staubbach Fall—Lauterbrunn—Switzerland.

LESSON **1640.**

ITALY.

1. Map of Italy. (To Locate Places to be Visited.
2. Naples. Panorama and Bay. Mt. Vesuvius in Distance. Castle Ovo.
3. Vesuvius in Eruption (1872.)
4. Pompeii. General View of Forum Mt. Vesuvius in Background.
5. Diana Marina. Earthquake Effects. Houses in Ruins. Donkey and Rider.
6. Naples. A Back Street Beauty.
7. Capri. Interior of Blue Grotto, Looking Out.
8. Rome. View from the French Academy. St. Peter's and Castle of St. Angelo in Distance.
9. Rome. St. Peter's, The Piazza, Colonnade, and Vatican Palace.
10. Rome. Interior of St. Peter's.
11. Rome. The Vatican. Gallery of the Candelabra.
12. Rome. The Forum from the Capitoline. Hill, Looking towards Arch of Titus. Temple of Saturn on Left. Basilica Julia. Temple of Castor and Pollux Coliseum in Distance.

13. Arch of Constantine and Coliseum. Meta Sudans or Gladiator's Fountain on Right.
14. Rome. Interior of Coliseum.
15. Rome. Catacombs. Niches and Sarcophagi.
16. Florence. Panorama from Piazza Michael Angelo. Arno River in Foreground. Cathedral, Giotto's Tower, Palazzo Vecchio, San Lorenzo in Distance.
17. Florence. Exterior of Baptistery. Gates of Ghiberti.
18. Florence. Baptistery. Ghiberti's Gates. Near View Showing Detail.
19. Florence. Palazzo Vecchio. Loggia di Lanzi on Right. Fountain of Neptune on Left.
20. Florence. Exterior of Church of Santa Croce. Statue of Dante on Left.
21. Florence. Peasants. Ox Cart.
22. Fiesole. Girl Making Straw Braid at Ten Cents a Day. Simple Hand Loom.
23. Pisa. Leaning Tower. (Bell Tower.) Corner of Cathedral on Left.
24. Padua. University. Street Scene. Italian Signs over Shops.
25. Venice. Grand Canal. Gondola. Doges' Palace. Campanile of St. Mark's Church.
26. Venice. St. Mark's from the Piazza. Colonnade with Shops on Left.
27. Venice. House of Desdemona. Grand Canal.
28. Venice. Lemonade Seller. Canal. Gondolas. Small Steamer.
29. Milan. Cathedral. Front and South Side.
30. Lake Como, Lavendo and Island of Comacina. Mountains in Distance.
31. Cathedral at Milan.

LESSON **1641.**

MILAN—VERONA—NAPLES—FLORENCE—ITALY.

1. Milan. Cathedral.
2. Milan. Cathedral, Detail.
3. Milan. Cathedral. Interior.
4. Milan. Arcades.
5. Milan. Statue of Victor Emanuel.
6. Milan. Leonardo da Vinci.
7. Verona. General View.
8. Verona. Market Place.
9. Verona. Ancient Gate.
10. Verona. Church Yard.
11. Verona. Arcades on Square.
12. Verona. Tomb of the Scaligera.
13. Verona. Entrance to Church.
14. Verona. Tomb of Saint.
15. Verona. Monument of Dante.
16. Naples. Bay near Portici.
17. Naples. Bay and Bathers.
18. Naples. Palms.
19. Naples. Palms in Park.
20. Naples. Square of the Martyrs.
21. Naples. Square near Park.
22. Florence. Arcades.
23. Florence. Church of San Marco.
24. Florence. Bridge.

LESSON **1642.**

VENICE—ITALY.

1. Venice. Grand Canal.
2. Venice. Bridge of Sighs.
3. Venice. St. Mark's Bell Tower.
4. Venice. St. Mark's. Interior.
5. Venice. St. Mark's. Side View.
6. Venice. St. Mark's.
7. Venice. Royal Palace and Column of St. Mark.
8. Venice. St. Salute and Gondolier.
9. Venice. Grand Canal.
10. Venice. Corner of Doge's Palace.
11. Venice. Doge's Palace—Piazetta Side.
12. Venice. Doge's Palace from Riva d'a Sciavone.
13. Venice. Doge's Palace, Interior.
14. Venice. Doge's Palace, Giant Stairs.
15. Venice. The Rialto.
16. Venice. Grand Canal, Degana.
17. Venice. Doge's Palace, Council Hall.
18. Venice. Doge's Palace, Side Entrance.
19. Venice. Bell Tower and Pigeons.

LESSON **1643.**

ROME--ITALY.

1. Rome. Forum with Coliseum.
2. Rome. View from Coliseum.
3. Rome. View with part of Forum.
4. Rome. Forum.
5. Rome. Forum. three Arches.
6. Rome. Forum.
7. Rome. Fountain.
8. Rome. Temple of Vesta.
9. Rome. Column of Marcus Aurelius.
10. Rome. Column of Trajan.
11. Rome. Church d'a Spania.
12. Rome. Propaganda.
13. Rome. St. Peters.

LESSON **1644.**

GREECE, PAST AND PRESENT.

1. The Piraeus. Port of Athens. Bay in Background.
2. Athens. Hill of Mars (Areopagus.) Panorama of City below. Temple of Theseus.
3. Athens. Temple of Theseus. Exterior.
4. The Acropolis from S. W. The Parthenon, Propylaea, Temple of Nike. Roman Arches at Foot of Hill.
5. Athens. The Parthenon. Exterior.
6. Athens. The Parthenon. Interior. Complete Ruin. Outer Colonnade Visible.
7. Athens. The Parthenon. Fragment of Frieze. Horsemen.
8. Athens. The Parthenon. Fragment of Frieze. Seated Divinities.
9. Elgin Room in the British Museum Containing Fragments of the Parthenon Sculptures. Metopes and Fragments of Frieze on Wall. Fragments of Pediment on Pedestals.
10. Athens. The Erechtheum, From the West. Ionic Order. Porch of the Caryatides on the Right.
11. Athens. Caryatides on the Erechtheum. Near View.
12. Athens. Temple of Athens. Nike (Victory.) Ionic Order.
13. Athens. Choragic Monument of Lysicrates. Corinthian Order.
14. Athens. Theater of Dionysos (Bacchus.)
15. Athens. Ruins of Temple of Jupiter Olympus.
16. Athens. Prison of Socrates.
17. Athens. Acropolis Museum. Archaic Statue of a Woman.
18. Venus of Milo. Greek Statue now in the Louvre, Paris.
19. Athlete Preparing to Throw the Discus, by Myron. Now in the Vatican. Rome.
20. Richly Decorated Greek Vase or Amphora.
21. Athens. Statue of Byron in Greece.
22. Athens. The Royal Palace. Exterior.
23. Athens. The University. Exterior, Garden.
24. Athens. House of Dr. Schlieman. Exterior.
25. Athens. Shepherd and Flock Near Hill of Nymphs.
26. Athens. A Greek in National Costume.

LESSON **1645.**

HOLLAND AND BELGIUM.

1. Map of Holland and Belgium. (To Locate Places to be Visited).

HOLLAND.

2. Haarlem. The Spaarne. Wind Mills. Lift Bridge.
3. Haarlem. A Dutch family, Typical Peasants. Wooden Shoes.
4. Haarlem. Amsterdam Gate, Towers, Clock.
5. Amsterdam. Queen's Palace. Exterior. Monument in Foreground. Crowned with Statue of Goddess of Concord.
6. Holland. The Hague. Canal Scene. Boats.
7. The Hague. Museum of Art. Exterior.

8. Rotterdam. Canal. Wharf. Canal Boat. Windmill.
9. Zwolle. Canal. Windmill.
10. Delft. A Bit of Old Holland. Canal, Bridge, Trees, Houses.
11. Typical Houses. Tiled Roofs.
12. Group of Dutch Peasants in Costume. Village Street.

BELGIUM.

13. Antwerp. Statue of Rubens. Cathedral in Background.
14. Antwerp. Cathedral from South. Small Park in Foreground.
15. Antwerp. Team of Flemish Draught Horses. Cart Loaded with Barrels.
16. Bruges. City Hall with Great Belfry. (Longfellow's Poem).
17. Brussels. The Bourse or Exchange. Exterior. Renaissance Style.
18. Brussels. Cathedral of St. Gudule. Exterior. Street Scene.
19. Brussels. Flower Market. Richly Decorated Houses in Background.
20. Brussels. Milk Cart Drawn by Dog. Milkmaid.
21. Waterloo. Hilltop Crowned with Monument of British Lion.

LESSON 1646.

NORWAY AND DENMARK.

NORWAY.

1. Map of Norway and Sweden.
2. Tromso Harbor. Sailing Vessels. Buoys. Snow-covered Mountain in Distance.
3. A Norwegian Fiord. Sailing Vessel. Roadway.
4. A Mountain Glacier. Svartisen.
5. Gorge in Mountains with Road. Great Patches of Snow.
6. Ice Cavern. Little Boy Inside
7. Waterfalls at Ringedal. Rugged Mountain Scenery.
8. Waterfall. Tilted Strata. Hardanger.
9. Seven Sisters Falls. Slender Streams of Water Falling from Great Height into Lake.
10. Christiana from the Ekeburg. Harbor. Vessels. Distant Mountains.
11. Parliament Buildings. Christiania.
12. Carved Pulpit. Stavanger Cathedral. Romanesque Arches and Pier.
13. Hitterdal Church. Typical Norwegian Church. Cemetery in Foreground.
14. Typical Farmhouse and Out buildings, Mountains in Distance.
15. Typical Cottages. Upper Story Projecting. Steep Projecting Roofs. Thelemarken.
16. Interior of Cottage. Stove, Beds, Chair, etc. Thelemarken.
17. Hardanger Woman in National Costume.
18. Children in National Costume. Quoit Rings on Right.
19. Norwegian Tramp. Carries Tin Bucket and Stick. Mountains in Background.
20. Norwegian Carriole. Lady Driving. Footman Sits Behind. Summer, Woods, Cottages and Mountains in Background.
21. Washing Clothes by River Vinje.
22. Flowery Meadow. Trees, Snow-capped Mountains in Distance.
23. Haymaking. Jordal. Hay Piled in Tall Slender Stacks. Men and Women at Work.
24. Summer. Wooded Cliff in Background. Lake in Foreground. Swans.
25. Salmon Fishing. Two Men in Boat Fishing with Poles and Line.
26. Norwegian Girl on Snow Shoes. Pine Forest in Distance.
27. Herd of Reindeer. Lapp Encampment. Natives in Costume. Tromso.
28. Midnight Sun at North Cape.

DENMARK.

29. Copenhagen. The Nyhaven or Harbor. Sail Boats. Quay.
30. Copenhagen. Thorwaldsen Museum. Exterior. River in Foreground.
31. Copenhagen. Thorwaldsen Museum. Interior. Statue of Pius VII.
32. Fredericksburg. Museum. Model of Viking Boat.
33. Copenhagen. A Bybud or Messenger.
34. Copenhagen. Fish Sellers. Women on Sidewalk with Baskets of Fish.

LESSON **1647.**

RUSSIA.

1. Map of Russia. (To Locate Places to be Visited).
2. St. Petersburg. The Palace Quay. Neva River. Tugs and Barges. Corner of Bridge on Left.
3. St. Petersburg. Russian Navy Yard. Sheds in Process of Building.
4. St. Petersburg. Statue of Peter the Great. Admiralty Palace.
5. St. Petersburg. Alexander Gardens. People Resting on Bench.
6. A Drosky. Four-Wheeled Russian Carriage.
7. Shrine in Greek Chapel. Richly Decorated.
8. Moscow. Panorama of the Kremlin, River Moskva on Right.
9. Moscow. The Kremlin, inside the Walls.
10. Moscow. Great Bell in the Kremlin, Decorated, Broken.
11. Moscow. Church of St. Basil. Exterior.
12. Moscow. Interior of Church of the Assumption where the Czar is Crowned. Columns Decorated with Paintings. Candelabra.
13. Russian Soldiers Working. Houses.
14. St. Petersburg. Tartar Peddlers.
15. Farm Scene, Wagon and Horse with Group of Natives in Foreground.
16. Finland, Helsingfors. On the Gulf of Finland.
17. Finland. Farmer's Cabin. Family.
18. Finland. Mill. Woods in Background.
19. Finland. Farmers' Market. Drosky.
20. Finland, Nurmijavoi Lake. Boating.
21. Finland. Fishing Boats Moored at Dock. Fisherman Selling Fish.
22. Finland, Viborg. A Group in the Fish Market.
23. Finland, Sippola. Peasant Women Harvesting.
24. Finland, Sippola. A Bride on her Way to Church. Elaborate Headdress. Forest.
25. Finland. Peasant Flower Girls.
26. Siberia. Vladivostock. Panorama Looking North.
27. Siberia. A Mounted Cossack. Village in Background.
28. Siberia. Group of Natives. Russian Costume.

LESSON **1648.**

RUSSO-JAPANESE WAR AND RUSSIAN REVOLUTION.

1. Scene of Map of War.
2. The Russian Fleet.
3. The Japanese Fleet.
4. Russian Battleship Czarwitch.
5. Japanese Battleship Mikasa.
6. Japanese Torpedo Boat Destroyer.
7. How a Torpedo Attack is Made.
8. Czar Nicholas, of Russia.
9. Emperor of Japan.
10. Map of the Great Trans-Siberian R. R.
11. Harbor Vladivostok.
12. General Kuropatkin.
13. River Front, Tokio.
14. Marquis Ito.
15. Russian Soldiers in Winter Camp.
16. Prayer before a Battle.
17. Japanese Troops Landing in Chempulpo.
18. Vice-Admiral Togo, the Japanese Nelson. Russian Japanese War.
19. Battle between Torpedo Boats.
20. Destruction of the Petroparlorsk.
21. Russian Japanese War. 16th Regiment passing through Teng Wang Cheng on the Advance to Molien Pass.
22. Battle of the Yalie, First Land Fight.
23. Russian Japanese War. Manchuria. Wounded Russian Prisoners from the Battle of the Yalie.
24. Charging across the Ai Ho River.
25. Russian Japanese War. Manchuria. Japanese Transport Men Getting Supplies to Kuroki's Army.
26. A Japanese Bayonet Charge.
27. Japan's First Real Reverse.
28. Korean Military Escort.
29. Group of Corean Statesmen.
30. Russian Cossacks.
31. Hand to Hand Fighting.
32. Fire! the Advance on Liao Yang. Battery in Action.
33. Liao Yang the Day Following its

Evacuation by Kuropatkin, September 4th, 1904. Scene of the First Great Engagement of Modern Equipped Armies.

34. Japanese Soldiers Unloading Transport at Yinkow Just Before Freezing of the River. Kuroki's Army.

35. Chinese Coolies Impressed into the Japanese Service Carrying Bean-Cake at Autung. Kuroki's Army.

36. Kuropatkin's Masterly Retreat.

37. Japs Cremating their Dead.

38. Field Marshall Oyama.

39. The Russian Baltic Fleet.

40. Tragedy of the North Sea.

41. City of Port Arthur.

42. Siege of Port Arthur.

43. Destruction of Port Arthur Fleet.

44. Port Arthur Surrenders.

45. Victor and Vanquished.

46. Hand to Hand Fighting with Stones.

47. Flight of the Russians from Mukden.

48. Russians on the Way Home.

49. View of Odessa Harbor.

50. Nevsky Prospect, St. Petersburg Main Street.

51. Strikers Erecting Barricades.

52. Father Gapon Leading the Strikers.

53. Firing on the People at Froitzky Bridge.

54. Cossack Charge in Palace Square.

55. Guarding the Railway near Moscow.

56. Martyrs to the Cause of Freedom.

57. Assassination of the Grand Duke.

58. Czar Receiving a Deputation.

59. The Kremlinat, Moscow.

60. The Peace Commission.

LESSON **1649.**

BRITISH EMPIRE IN ASIA.

INDIA.

1. Map of Indian Empire. (To Locate Places to be Visited).

2. Bombay. University and Esplanade from Watson's Hotel.

3. The Himalayas. Snowy Range from Sandakfoo.

4. Amritsar. Golden Temple on Island in Artificial Lake.

5. Delhi. Ruins of Hindu Observatory.

6. Agra. Taj Mahal from Gateway. Avenue of Cypress Trees.

7. Cawnpore. Memorial Statue, Erected after Massacre by Sepoys.

8. Madura. Great Temple.

9. Benares. Monkey Temple. Feeding the Monkeys.

10. Calcutta. General Post Office.

11. Calcutta. Royal Botanical Garden.

12. Calcutta. Royal Botanical Garden. Avenue of Palms.

13. A Coffee Plantation. Houses.

14. A Jinrikisha or Two-Wheeled Carriage Drawn and Pushed by Natives.

15. Bamboo House. A Bungalow. Thatched Roof.

16. Ascetic Buried up to Neck. Natives.

17. Hindoo Lady. Elaborate Jewelry, Watch and Chain. Barefooted.

CEYLON.

18. Colombo. Native Plowing with Oxen. Plow is a Rude Stick.

19. Coffee Plant. Thick Matted Growth.

20. Rubber Tree. Large Spreading Roots.

21. Palm Tree. Typical Scenery.

22. Elephant Stables. Ruins.

23. Singapore. Native Boys in Canoes. Diving.

LESSON **1650.**

WESTERN AND CENTRAL ASIA.

1. Map of the World. Trace Water Route from New York to Western Asia Passing through Mediterranean.

2. Moonlight on the Mediterranean.

3. Map of Asia. Locate Places to be Visited.

SYRIA.

4. Palestine, Jerusalem. Panorama from the North. Wall with Ornamented Battlements in Foreground.

5. Palestine, Jerusalem. Panorama from the North. Wall with Ornamented Battlements in Foreground.

6. Palestine, Jerusalem. Garden of Gethsemane in Foreground. Cypress Trees.

7. Palestine, Nazareth. City in Foreground. Hills in the Distance.

8. Palestine, Bethlehem. Remains of Ancient Aqueduct in Foreground.

9. Palestine, Bethlehem. Pilgrims Entering Gates of the City on Christmas Day.

10. Palestine, Bethlehem. Church of Nativity. Exterior.

11. Palestine. Dead Sea in Background. Tourist and Natives in Foreground, Mounted on Donkeys.

12. Palestine. Fig Tree.

13. Palestine. Rude Stone Houses. Thatched. Native with Oxen in Foreground, Threshing.

14. Palestine. A Rabbi.

15. Group of Lepers.

16. Damascus. Group of Lepers in front of the Lepers' House.

17. Low Flat Houses of Rock with Sleeping Places on the Top.

18. Damascus. Interior of Wealthy Home. Rich Decorations. Fountain.

19. A Snake Charmer.

20. Baalbeck. Ruins of Peristyle of Great Temple. Corinthian Order.

21. Suez Canal. Ship passing through Canal.

ARABIA.

21. Suez Canal. Ship Passing through Houses. Barren Mountains in Background.

23. Women in Native Costume, Veiled.

24. Natives at Prayer.

PERSIA.

25. Teheran. Native Women Weaving Carpet by Hand. Portion of Finished Carpet.

26. Teheran. Interior of Bazaar. Grocer's Shop. Group of Natives.

27. Teheran. Cultivating the Soil. One Holds Rake, whilst Another Draws It.

28. Persian School. Group of Teachers and Pupils, Some Seated on Ground.

29. Native Musicians and Dancers, Showing Costumes and Musical Instruments.

LESSON 1651.

A TRIP TO ASIA, CHINA AND JAPAN.

1. Map of China and Japan. To Locate Places to be Visited.

CHINA.

2. Pekin. Panorama from Observatory and Houses.

3. Pekin from Wall, Showing British Legation. Houses, Walls and Large Arches at Intersection of Streets. Sewage Flowing down Middle of Street.

4. Hong Kong. Mandarin in Official Dress.

5. Two Chinese Children. Bamboo Fence.

6. Women of Middle Class. Small Feet. Carry Fans. Brick Wall of House in Background. Potted Plants.

7. Junk under Sail.

8. Canton. House Boats on River, Moored in Rows.

9. Irrigating Rice Fields. Group of Chinese and Tourists.

JAPAN.

10. Japanese Scenery. Mt. Miyanoshita. Snow-capped. Volcanic Origin. Foliage and Houses in Foreground.

11. Japanese Scenery with Mount Fugi in Background. Bridge, Barges.

12. Gifu. Bridge Ruined by Earthquake.

13. Tokio. Panorama. Bay of Tokio in Distance.

14. Tokio. Bamboo Groves in the Palace Grounds. Bamboo Fences.

15. Tokio. Tea House in Garden.

16. Colossal Statue of Buddha.

17. Japanese Cleaning Rice.

18. Painter Decorating China.

19. Women Spinning and Weaving Silk. Hand Loom.

20. Newspaper Boy.

21. Landscape Gardening. Stream with Bridge. Wisteria Hanging from Trees.

22. Buddhist Priest and Acolytes.

23. A Mother Playing with Her Baby. Matting on Floor and before Window.

24. Two Children Eating with Chop Sticks. Mother Preparing Food.

25. A Family at Their Mid-day Meal. Sitting on Floor before Low Tables. Matting on Floor.

26. Playing at the Game of "Go" (Resembling Checkers). Players Sitting on Floor. Tea Pot and Cups near Them.

27. Iris Garden. Horikiri. Japanese in National Costume.

LESSON 1652.

A VISIT IN JAPAN.

1. Cherry Trees in Blossom—Uyeno Park—Tokio.
2. Chrysanthemum Plant in Imperial Gardens.
3. Avenue of Cryptomerias—Nikko.
4. In the Grounds of the Imperial University—Tokio.
5. Street in Shimbashi—Tokio.
6. Five Storied Pagoda—Nikko.
7. The Red Bridge—Nikko.
8. Nagasaki Harbor from the South.
9. Stone Portals—O'Suwa Temple—Nagasaki.
10. Bronze Horse and Gateway—O'Suwa Temple—Nagasaki.
11. Great Bronze Statue of Buddha.
12. Rock-cut Image of Jizo—Near Hakone Lake.
13. At Matsushima.
14. Fuji San from Numagawa.
15. In the Crater of Bandai Sau.
16. Ancient Cave Dwellings.
17. Tea Picking—Uji.
18. Grinding Corn.
19. A Vegetable Dealer.
20. Treating Lacquer in the Sunshine.
21. Painting Kaki—Monos.
22. Girls Dancing and Playing on the Samisen and Koto.
23. Girl at her Toilet.
24. An Actor.
25. A Country Girl.
26. Taking Baby for an Airing.

LESSON 1653.

AUSTRALIA AND THE ISLANDS OF THE PACIFIC.

1. Map of Eastern Hemisphere. (To Locate Places to be Visited).
2. May of Australia in Relief, Showing Character of Country.
3. Australia, Melbourne. The Yarra-Yarra River. City in Distance.
4. Australia, Melbourne. University Buildings.
5. Australia, Melbourne. New Town Hall.
6. Australia. Plowing a Bush Farm with Bullock Team. English Farmers.
7. Australia, Sidney. A Cattle Herd on Darling Downs.
8. Australia, Queensland. Aborigines Throwing Boomerang. Forest.
9. Tasmania. Commandant's Residence.
10. Tasmania. Forest of Fucalyptus Trees.
11. Tasmania. Forest. Gigantic Ferns in Foreground.
12. New Zealand. View of City of Dunedin. Beautiful Gothic Monument.
13. New Zealand, Parihaka. Maori Capital. Group of Huts.
14. New Zealand. Head of Native Chief Tatooed.
15. Samoa. Coral Gatherers. Palms.
16. Fiji Islands. Typical Scenery. Gigantic Palms. Native Huts.
17. New Guinea. Huts in Trees. Group of Natives.
18. Philippine Islands. Palm Forest. Native Huts. Bamboo Bridge.
19. Philippine Islands. Manila. Cathedral.
20. Philippine Islands. Manila. Bamboo Lumber Yard.
21. Philippine Islands. Manila. A Business Street at Mid-day. Awnings Lowered.
22. Philippine Islands. Group of Natives. Thatched House. Palm Trees.
23. Philippine Islands. A Wealthy Half-caste Lady. Richly Brocaded Dress. Type More Spanish than Mongolian. Refined Appearance.
24. Philippine Islands. Preparing Hemp.
25. Philippine Islands. Group of Natives in Two-Wheeled Cart, Shafts of Bamboo. Native House in Background.
26. Hawaii. Typical Scenery in Mountains. Rugged Outline.
27. Hawaii, Honolulu. Iolani Palace. Public Square. Mountains in Distance.
28. Hawaii. Dancing Girls with Musical Instruments.
29. Hawaii. Lady on Horseback.
30. Hawaii. O'd Native Hut with Thatched Sides.
31. Homeward Bound. View on Pacific Ocean. Ocean Steamer in Distarce.
32. Map of Australia.
33. Natives and Huts — Pompanga. P. I.

LESSON **1654.**

SOUTH AFRICA.

1. Map of Africa in Relief, Illustrating Physical Features.
2. Cape Town. Table Mountain. Bay in Foreground. City in Distance.
3. Cape Colony. Ostrich Farm.
4. Transvaal. Typical Bit of the Veldt or Prairie. Stream. Miners Panning Gold.
5. Vaal River. Searching Gravel for Diamonds.
6. South Africa. Hydraulicing for Gold.
7. Transvaal, Pretoria. Raadzaal or Parliament House.
8. Transvaal, Pretoria. President Kruger's House. Guards.
9. Transvaal. The Exchange. Natives.
10. Transvaal. A Typical Boer Farm House. Natives.
11. Transvaal, Johannesburg. An Uitlander Camp.
12. Transvaal. Boer Family Trekking. Wagon Drawn by Oxen.
13. Natal. Majuba Hill. Railroad.
14. Kimberly. Armored Engine.
15. Kimberly. Interior of a Zulu Hut. Kitchen Utensils. Roof Made of Reeds.
16. A Group of Kafirs on the Veldt.
17. Congo Region. Caravan Crossing River. Mountain in Distance.
18. Congo Region. Bianzi Native Woman. Negro Type.
19. Congo Region. Bianzi House Decorated with Human Skulls. Thatched Roof. No Walls.
20. Congo Free State. Dutch Trader Buying Ivory. Natives.
21. St. Helena, Longwood. Napoleon's Last Residence.

LESSON **1655.**

A TRIP TO EGYPT. No. 1.

1. Map of the Nile.
2. The Nile. Dahabieh (Nile Boat).
3. The Nile. First Cataract of the Nile. Native Swimming.
4. A Sakkieb. Method of Irrigation. A Cogwheel worked by Oxen Sets in Motion a Vertical Wheel Set Round with Water Jars that Dip in River and Pour Water in Troughs that Lead to the Fields to be Irrigated.
5. Alexandria. Pompey's Pillar. Solitary Corinthian Column.
6. Alexandria. Square of Mahomet Ali. Garden of Tropical Plants Surrounded by Buildings.
7. Cairo. View of Citadel and Mosque of Mahomet Ali.
8. Cairo. The Minaret of a Mosque. Muezzins Calling the Hour of Prayer.
9. Dancing Dervishes.
10. A Native Elementary School. Pupils Seated on Floor. Lattice Work.
11. A Veiled Woman. Mahommedan Custom.
12. Cairo. An Arabic Cafe. Tables Out of Doors. Natives in Costume. Arabic Arch over Doorway.
13. Arab Woman and Baby.
14. A Grocer's Shop. Exterior. Large Doors.
15. Donkeys and their Drivers.
16. A Snake Charmer.
17. Cairo. Gizeh Museum. Interior. Antique Objects Arranged in Cases.
18. Cairo. Gizeh Museum. Statues of Ra-hotep and his Wife Nofert, 2900 B. C.
19. Distant View of the Pyramids of Gizeh. Palm Trees in Foreground.
20. The Sphinx. Pyramids in Distance.
21. Climbing the Great Pyramid.
22. Tombs Cut into the Mountain Side. Beni-Hassan.
23. Memphis. Prostrate Statue of Rameses II. Palm Trees.
24. The Isle of Philae. Ruins of Temple—"Bed of Pharaoh."
25. Thebes, Karnak. General View of Ruins of Great Temple. Obelisk in Foreground.
26. Thebes, Karnak. Great Hall of Columns. Looking Down One of the Aisles.
27. Thebes, The Ramesseum. Colossal Figures with Arms Crossed Standing before Piers.
28. Hieroglyphics on Wall of Temple of Isis.
29. Rock-cut Temple of Abu Simbel from the Nile. Sand Drifts on Either Side.
30. Modern Egyptian Village.

LESSON **1656.**

A TRIP TO EGYPT. No. 2.

1. Map. (To Locate Places to be Visited).
2. Dahabiehs, or Nile Boats.
3. Site of Memphis. Typical Scenery on Nile. Palm Trees.
4. The Nilometer. Column Stands in Well which Connects with Nile. When Water Rises, its Height is Indicated on Column.
5. A Shaduf. Irrigating Machine. (Plan of Old Oaken Bucket).
6. Cairo. View from the Citadel. Mosque. Battlements of Citadel in Foreground.
7. Cairo. The Citadel. Mosque of Mahomet Ali in Distance.
8. Cairo. Shepherd's Hotel. European Style of Building. Foreigners' Headquarters.
9. Cairo. Khedive in Carriage. Mounted Guards.
10. Buildings Showing Egyptian Lattices of Mushrebiyeh Work. Natives on Donkeys in Foreground.
11. Cairo. Among the Bazaars. Interior of Fruit Store. Natives in Foreground.
12. A Barber's Shop. Native with Pipe Waiting while Boy is Being Shaved.
13. Native Women Going to the Cemetery. Wagon Drawn by Ox. Women Veiled.
14. Arab Family at Dinner. Seated on Ground. Peculiar Drinking Vessels. Table of Thin Reeds.
15. An Alexandrian Beggar.
16. Boulak. Copper Market. Kitchen Utensils for Sale.
17. Wadi Halfa. Nubian Group with Camels.
18. Avenue Leading to the Pyramids of Gizeh. Acacia Trees—Three Pyramids in Distance.
19. Pyramid of Cheops. Showing Entrance.
20. Pyramid of Cheops. The Ascent. Group of Natives and Donkeys at Base.
21. Mound of Ancient Debris.
22. Assiut. Tombs in the Mountain Side.
23. Sakkara. Apis Tombs. Great Sarcophagus.
24. Procession of the Bull Apis. Imaginary Scene. Artist—Bouguereau.
25. Thebes. Ruins of Temple of Medinet Habu. Columns, Great Gateways or Pylons.
26. Luxor. Ruins of Temple of Amenhotep III. Columns Resembling Bundles of Reeds.
27. Denderah. Ruins of Temple, Partly Buried in Sand. Isis-faced Capitals. Hieroglyphics.
28. Heliopolis, the Great Obelisk. Scene of Moses' Youth.
29. Suez Canal. Ships Passing through Canal.

LESSON **1657.**

EGYPT—THE LAND OF THE PYRAMIDS. No. 3.

1. Map. (To Locate Places to be Visited).
2. Alexandria. Harbor. Sail Boats. Ocean Steamers in Distance.
3. Alexandria. "Cleopatra's Needle" —Obelisk with Hieroglyphics. City in Distance.
4. The Nile in Flood. Village and Palm Trees.
5. A Sakkieh. Irrigating Machine. A Cog-wheel Worked by Oxen Sets in Motion a Vertical Wheel Set Round with Water Jars that Dip in River and Pour Water in Troughs that Lead to the Fields to be Irrigated.
6. Cairo. Farmers in the Fields. Raking. Two Overseers.
7. Cairo. General View of a City Showing Mosques and Flat-roofed Houses with Gardens.
8. Cairo. Tombs of the Mameluks. Mosques, Small Domed Buildings.
9. Cairo. Street Scene. Outrunners and Carriage.
10. Cairo. Carpet Bazaar. Interior.
11. Cairo. Arab Women, Veiled, Carrying Water Jars.
12. Cairo. Nile Bridge. Soldiers. Natives.
13. Cairo. On the Way to the Pyramids. Tourists Mounted on Donkeys. Native Guides.
14. Pyramid of Chephren and Great Sphinx.

15. Pyramid of Cheops. Natives Mounted on Camels in Foreground.
16. Plan of the Interior of Pyramid of Cheops Showing Passages, King and Queen's Chambers, etc.
17. Pyramid of Cheops. Interior. The Great Hall or Passage Way.
18. Sakkarah. Step Pyramid.
19. Luxor from the Nile. Ruins of Temples in Distance.
20. Isle of Philae. Ruins of Temple of Isis.
21. Isle of Philae. Ruins of Temple —"Bed of Pharaoh."
22. Thebes. The Great Gateway of the Temple of Karnak.
23. Thebes. Great Hall of Temple of Karnak. Looking down One of the Aisles.
24. Abu Simbel. Rock-cut Temple. Colossal Statues of Rameses II. at Entrance.
25. Abu Simbel. Rock-cut Temple. Interior.
26. Cairo. Gizeh Museum. Mummy of Rameses II.
27. Thebes. The Colossal Statues of Amenoph III., Called by the Greeks "Statues of Memnon."
28. The Isle of Philae. Ptolemaic Land-Grant Stone.

LESSON 1658.

TRIP TO ALGIERS.

1. Algiers from the Harbor.
2. Algiers from the Marengo Gardens.
3. Mosque and Place du Government
4. Colonnade of the Djamaa—El Kebir Mosque.
5. Fountain inside of Djamaa—El Kebir Mosque.
6. Museum First Floor.
7. Exterior of Moorish Villa.
8. Street Scene.
9. Arab.
10. Drawing Water.
11. The Bazaar.
12. Under the Palms.
13. Arab—"Castermonger."
14. Camels.

LESSON 1659.

MODES OF TRAVEL.

ON LAND.

1. Crossing the Desert on Camels.
2. Palanquin. Bearers Resting. Calcutta.
3. A Dog Cart. Belgium.
4. Hay Wagon Drawn by Oxen. Pyrenees Mountains.
5. Six-Horse Overland Stage. Old Way of Crossing the Western Prairies.
6. Gipsy Camp. Meal Time. Wagons.
7. First Passenger Train in U. S.
8. Limited Express on Erie Railroad.
9. Interior of Pullman Sleeping Car.
10. Interior of Pullman Dining Car.

ON WATER.

11. Sail Boat. Sails Spread.
12. Scudding under Full Sail.
13. First Steamboat on the Hudson. Fulton's.
14. River Steamers. Side-wheel. River Front at Cincinnati.
15. Row Boats with Awnings. Steam Launch. Sailing Boats in the Distance. Port Said, Suez Canal.
16. Ocean Steamer. Sea Gulls. Queenstown Harbor in Distance.
17. Ocean Steamer. Front View. Decorated with Flags.
18. Ocean Liner Leaving Pier. Hull and Forward Deck Visible.
19. Saloon of S. S. Majestic. White Star Line.
20. Passengers on Deck S. S. Majestic. White Star Line.
21. Steerage of Steamer. Sleeping Bunks.

IN AIR.

22. Ballooning. Inflating Balloon.
23. Ballooning. In Mid Air.
24. Ballooning. Parachuting. Preparing to Let Go.

LESSON 1660.

SOME FORMS OF LAND AND WATER.

1. Map of North America in Relief. Physical Features Pointed Out.

2. Snow Covered Peak. Mount Shasta above the Clouds. Pine Trees, Farm Buildings in Foreground.

3. Climbing a Mountain. Avalanche Swept Surface. Mt. Blanc. Ropes Stretched Across to Assist in Ascent. Alpine Stocks.

4. Summit of Mt. Blanc. Men Connected by Ropes. Heavy Snow on Ground.

5. A Mountain Glacier. Can. Pac. Railroad.

6. A Mountain Pass. Tunnels. Railroad. High Andes, Peru.

7. Old Tree-Covered Mountains with Soft Rounded Outlines. Alleghenies, Pa. City of Altoona in Valley.

8. Grizzly Bear. Looking over Crag. Found in Rocky Mts.

9. Rocky Mountain Antelopes. Fairmount Park, Philadelphia. Home in Foot Hills of Rocky Mts.

10. Otter Lake with Kearsarge Mountain in Distance, N. H.

11. Hills with Small Lakes in Foreground. Also Illustrates Isthmus, Col.

12. Bay of Naples, with Vesuvius in the Distance (by Day).

13. Bay of Naples, with Vesuvius in the Distance (by Night).

14. Bay of Naples with Vesuvius in Action. Illustrates Internal Heat of Earth.

15. Oblong Geyser. Yellowstone Park. Another Illustration of the Internal Heat of the Earth.

16. Rolling Grass-covered Plain. Sheep Ranch, N. D.

17. Cave with Stalactites and Stalagmites. Illustrates Work of Underground Water.

18. How a River Cuts Its Bed. Weathering of Banks. Grand Canon of the Colorado River, Ariz.

19. A Winding River with Fertile Banks Formed by Alluvial Deposits and Weathering. Bluffs Beyond Elbe River, Germany.

20. A Broad and Fertile River Valley. The Thames. Farms. Village. Bridge.

21. A Very Broad River. Mississippi River at St. Louis. Eads Bridge. Steamer.

22. A Flood in the Mississippi River Valley. Flooded Country Back of Ames Crevasse near New Orleans. Houses and Fences Partly Submerged.

23. Effect of Floods. Road through Woods under Water. Dismal Swamp, Va.

24. Section of Niagara Showing the Arrangement of Hard and Soft Strata. Illustrating the Process of Erosion by Running Water and the Formation of Waterfalls.

25. Beginning of a Waterfall. Ind. Projecting Ledge of Hard Rock. Dry Season.

26. Whirlpool Rapids, Niagara. Suspension Bridge in the Distance.

27. American Falls, Niagara. Goat Island. Horse Shoe Falls in Distance.

28. Niagara. The Falls by Moonlight. Winter.

LESSON 1661.

THE OCEAN. (ELEMENTARY).

1. Land and Water Hemispheres. Shows Proportion of Water and Land on Earth's Surface.

2. Mid-Ocean View. (Colored). Waves. Blue Color of Water. Sunset Sky.

3. An Ocean Steamer. Passenger Vessel. Three Smoke Stacks.

4. A Flat and Sandy Coast. The Beach at Santa Monica, Cal. Bathers in Distance.

5. The Beach, Santa Monica, Cal. Bathers Reclining on Sand. Little Girl Picking up Shells. Pier in Distance. Surf.

6. A Pebbly Beach. Cape Ann, Mass.

7. A Rocky Coast. Cliffs and Sea Wall at Newport, R. I.

8. Shipwreck. Ship Driven by Wind on Flat Sandy Beach. Tilted to One Side. Heavy Surf.

9. Iceberg Off the Coast of Greenland. Reflected in Water.

10. A Norwegian Fiord. Steamers.

Patches of Snow on Distant Mountains.

11. A Harbor, in the Docks, Havre, France. Various Kinds of Ocean Craft. Quay in Foreground.

12. A Sea Shore View. Low Tide. Boats Anchored. Mountains in Distance. Beautiful Cloud Effects.

13. The Largest Creature That Lives in the Sea. Greenland Whale Spouting. Mouth Open Showing Fringe of Whalebone. Other Whales and Boats in Distance.

14. Deep Sea Fish. Large Mouth. No Eyes.

15. Very Small Creatures that Live in the Sea. Their Work. A Coral Island, Crescent Shaped. Covered with Vegetation. Sailing Vessel. Row Boat. Storm Clouds Gathering.

16. Serpula Atolls. (Coral Reefs that do not Enclose Islands).

18. A Piece of Coral. Minute Cells in which the Animals Once Lived.

18. Deep Sea Crinoid. Lowest Form of Animal Life. Resembles Flower. Attached to Sea Bottom.

19. The Eddystone Lighthouse. Day. Calm Sea. Row Boat.

20. The Eddystone Lighthouse. Night. Rough Sea. Waves Dashing Against Rocks. Sailing Vessel Tossing in Distance.

21. The Eddystone Lighthouse. Night. Raging Storm. Wreck of Vessel Dashed about by Waves.

22. Sunrise on the Atlantic. Calm Sea. Sun Reflected in Water. Clouds.

LESSON **1662.**

OCEAN TIDES.

1. Diagram Illustrating Cause of Tides. (Rackwork Attachment) As Moon Revolves around Earth an Elliptical Band around Latter, Representing Height of Tide, Moves with it. Moon's Phases Shown during Revolution. Portion of Sun's Disk on Left Can be Used to Explain Cause of Spring and Neap Tides.

2. Beach. Tide Out. Scotland.

3. Beach. Tide Coming in. Scotland.

4. Ebb Tide. Estuary. St. John's, N. B. Pine Trees on Bank. Bridge.

5. Flood Tide—From Same Point of View as Preceding. Difference in Height of Water.

6. An Estuary with Tide out. Clifton Suspension Bridge. Bristol, England.

7. An Estuary with Tide in. Same Point of View as Preceding.

8. A Tidal Wave. Mascaret of the Seine. Caudebec, France. Water Dashing over Quay.

9. Undercutting of Rocks by Tide. Australia.

LESSON **1663.**

RIVERS, VALLEYS, FLOOD PLAINS AND WATERFALLS.

1. Map of U. S. in Relief, Showing Area Drained by Mississippi River and its Tributaries. Illustrates Basin, Divide, River System, etc.

2. The Beginning of a River—Yahtse River, Alaska, Issuing from Malaspina Glacier.

3. The Beginning of a River. A Mountain Torrent. Scotland—How a River Cuts its Bed—Weathering of Sides of Stream.

4. Boulders Carried by a Mountain Stream—Their Cutting Power.

5. Ausable Chasm, N. Y., Illustrating Cutting Power of Water with very Little Weathering of Sides.

6. Diagram Illustrating the Erosion of Valleys by Streams and by Weathering.

Miss. River near St. Anthony's Falls, Illustrating a Stream in Upper Part of its Course. Current Rapid. Banks Steep.

8. Little Missouri River, N. D., Illustrating the Gradual Broadening of a River Valley. Current Becomes Less Rapid, Begins to Deposit its Detritus. Islands are Formed.

9. Sand Bar farming in Green River.

10. A Mature River Loop. Moccasin Bend. Tenn. River. The Flood-plain Enclosed by the Loop is Rich Farming Land.

11. Ox Bow Cut-off. Conn. River. New Channel Compared to Old.

12. Diagram Illustrating Formation of Flood Plains (Natural Adv. Geog).

13. Flooded Country. Parkersburg, W. Va.

14. Formation of Swamps. Trees Dying in Drummond Lake. Dismal Swamp. Va.

15. The End of a River. River with Comparatively Steep Banks Emptying into the Sea. Illustrates Estuary.

16. The End of a River. Yahtse River Gravel Delta. Current Being Checked as River Enters Ocean, it Deposits its Detritus.

17. Diagram Illustrating the Formation of Waterfalls and Rapids. Hard and Soft Strata.

18. Rapids on the Nile River. Native Swimming.

19. Rapids in Niagara River. Suspension Bridge in Distance.

20. The Beginning of a Waterfall. A Small Cataract in Ga.

21. Ithaca Falls, N. Y., in Flood.

22. Ithaca Falls, N. Y., in Dry Time.

23. Bird's Eye View of Niagara River and Falls, from Lake Erie to Lake Ontario.

24. Niagara Falls in Winter.

25. Rivers and Mountains.

26. Niagara Falls.

27. Section of Niagara River.

LESSON **1664.**

MISSISSIPPI RIVER SYSTEM.

1. Map of the Mississippi River System.

2. Minn., Mississippi River. Bluffs on the Banks. Row Boats. Ferry Run on Trolley Crossing River.

3. Minn., Mississippi River, St. Anthony's Falls. High Wooded Banks. Bridge. Steamer. Rapids in Foreground.

4. Minn., Cutting Ice on the Mississippi River. Bridge. Houses in Distance. Frame Buildings on Ice. Railroad Tracks in Foreground.

5. Minn., Ice Plow on the Mississippi River. Plow Drawn by Horses, Guided by Man. Elevated Tracks in Distance.

6. Minn., Mississippi River at Minneapolis. Bridges. Large Mills in Distance. Falls in Foreground.

7. Minn., Minneapolis. Mississippi Steamer Loading. Gang Plank. Merchandise on Wharf.

8. Minn., Interior of a Mississippi Steamer. Looking Down Grand Saloon or Hall Way. Chairs and Tables. Staterooms on Sides.

9. Minn., Minnehaha Falls.

10. Minn., Old Fort Snelling. Ivy-Covered. Battlements.

11. Minn., Mississippi River. Fort Snelling, Situated on Bluffs Over-looking the River.

12. Minn., St. Paul. Street View.

13. Mont., Missouri River. Great Falls. Steep Bank on Left.

14. Io., Council Bluffs. Panorama River in Distance.

15. Neb., Omaha. Bridge over River. Factories and Warehouses in Foreground.

16. Mo., St. Louis. Levee from Bridge. Steamers. Wharf Boats. Grain Elevator in Distance.

17. Cutting Drift Wood on Mississippi River Wharf Boat. Stern-Wheel Steamer Beyond. Men in Foreground Chopping and Sawing Wood.

18. Ohio, Cincinnati. Suspension Bridge. Steamers. Buildings in Distance.

19. Tenn., near Memphis. Mississippi River Looking South. Bridge in Distance. Snow on Ground. Wharf.

20. Ark., Arkansas River at Little Rock. Bridge over River. Buildings in Distance. Cattle in Foreground. Sand Bank.

21. La., New Orleans. Ferryboat. Teams on Boat. City in Distance.

22. La., New Orleans. Ocean Steamer "Milton" Loading Cotton at Levee.

23. La., Swamp. Trees Dying.

24. La., A Bayou on the Tchfunctcha River. Man in Boat in Foreground.

25. Delta of the Mississippi. Showing Passes Cut Through Deposit.

LESSON **1665.**

VOLCANOES, EARTHQUAKES AND GEYSERS.

1. Vertical Section of Volcano. Illustrates Cone, Crater, Fissures, Parasitic Cones, Rock Bed, etc.

2. A Volcano in Eruption, Liparian Is., near Sicily.

3. Crater of the Largest Volcano in the World. Kilauea, Hawaii, After a Collapse.

4. Crater of the Largest Volcano in the World. Fissures. Kilauea, Hawaii.

5. Silver Sword Plant Growing in Mouth of Old Crater. Illustrates Fertility of Lava when Disintegrated by Moisture.

6. Lava Flowing Over High Bank. Commencement of Flow, Hawaii.

7. Lava Flowing over High Bank. A few minutes later. Hawaii.

8. A Lava Cave with Lava Stalactites and Stalagmites. Hawaii.

9. Mt Vesuvius. Crater and Hardened Lava Stream.

10. Mt. Vesuvius—Lava Flow of 1873.

11. Excavated Forum of Pompeii with Vesuvius in the Distance.

12. Best Preserved House in Pompeii Recently Excavated. Peristyle.

13. A Volcanic Neck. Wyoming.

14. Diagram of Concentric Earthquake Waves. Relation of Earthquakes to Volanoes.

15. Japanese Earthquake 1891. Buildings in Ruins

16. Japanese Earthquake 1891. Settling of Earth Under Bridges.

17. Japanese Earthquake 1891. Distorted Railroad Track.

18. Former Volcanic Region. Geysers. Old Faithful before Eruption. Yellowstone National Park, Wyo.

19. Old Faithful Geyser in Eruption. Yellowstone National Park, Wyo.

20. Old Faithful Geyser. The Last Spurt. Yellowstone National Park, Wyo.

21. Old Faithful at its Height.

22. Cone, Yellowstone Lake.

23. Spike Geyser. Yellowstone National Park. Spike or Cone Formed by Mineral Deposits Held in Solution by Hot Water.

24. Past Volcanic Action — Fingal's Cave, Scotland. Basaltic Columns.

25. Mt. Vesuvius—Eruption of Fire and Smoke.

26. Mt. Pelee in Eruption.

27. Lava Bed.

28. Martinique—Mt. Pelee in Distance.

29. Martinique, the Ruined City toward the Bay.

30. Martinique, Remains of an Elaborate Entrance.

LESSON 1666.

GLACIERS PAST AND PRESENT.

1. Snow Fields, Swiss Alps.

2. The Matterhorn, Swiss Alps. Illustrates How the Snow Slips Down the Steep Sides of the Mountains and Accumulates in the Valleys.

3. Rhone Glacier. Illustrates How Gravity and Partial Melting Cause Glaciers to Move Down Inclined Slopes of Valleys. Stream Issuing from Foot of Glacier is Source of Rhone River.

4. Vietsch Glacier, Switzerland. Illustrates Lateral and Central Moraines. The Latter Formed by the Meeting and Union of Two Glaciers.

5. Near View of a Central Moraine, Bowdoin Glacier, Greenland. Huge Boulders Carried by Glaciers.

6. Crevasse in Glacier. Allows Large Boulders to Drop to Bottom of Glacier. How These Grind and Scar the Rocks.

7. A Forest Being Buried by an Advancing Glacier. Muir Glacier, Alaska.

8. A Glacier that Ends in the Sea. Ice Front of Muir Glacier, Alaska.

9. How Icebergs are Formed. Ice Front of Greenland Glacier. Blocks of Ice Detached and Floating away. Picture on Left Shows Proportion of Iceberg Above and Under Water.

10. A Near View of an Iceberg. Large Fissures or Rents. Reflection in Water.

11. Map of Former Glaciated Area of North America. Laurentian Glacier.

12. A Morainic Lake. Pike's Peak, Col.

13. An Ancient Moraine that Came Down to Nearly the Level of the Sea, Scotland.

14. Dolphin's Back. A Form of Glaciated Rock. Scotland.

15. Wave Cut in Ancient Moraine. Cape Ann, Mass.

16. A Drumlin near Meriden, Conn. A Morainic Hill.

17. Boulders Deposited by Old Glacier, Vt. Used to Construct Walls.

18. Glaciated Rock, "Big Stone of Cluny," Scotland.

19. Pot Holes in Post Glacial Gorge. Watkin's Glen, N. Y.

20. How Pot Holes Were Formed. A Miniature Whirlpool, Scotland.
21. Red River Valley Plain, N. D A Very Fertile Plain Once the Bottom of a Glacial Lake. Wheat Farm, Harvesting.
22. Muir Glacier—Lateral View.
23. Rhone Glacier.
24. Rhone Crevasse.
25. Mer de Glace.
26. Grindelwald Ice Cave.
27. The Matterhorn.
28. Aletsch Horn—Jungfrau.

LESSON 1667.

THE UPHEAVAL OF THE LAND.

Mountains, Plateaus, Mountain Valleys, Etc.

1. Relief Map of North America. Illustrating Past and Present Movements of Earth's Crust—Rising and Sinking Coasts—Young and Old Mountains. Plateaus.
2. Shriveled Apple to Illustrate the Origin of Certain Mountain Ranges Resulting from Shrinkage of the Interior of the Globe.
3. Typical Drowned Coast Line. Numerous Islands. Irregular Outline. Bermudas.
4. Typical Raised Beach. Flat Surface Even Outline. St. Kilda, Scotland.
5. Shale Rock Containing Brachiopods (See Shell Fish) Found at Ithaca, N. Y. Illustrates Uplift of Sea Bottom.
6. Shale Rock. Horizontal Strata. Illustrating Even Uplift of Sea Bottom. Ithaca, N. Y.
7. A Chalk Plateau. Horizontal Strata, Even Uplift. Hastings, England.
8. Inclined Strata. Illustrates Uneven Uplift. Orkney Is.
9. Rock Layers Standing on End. Utah. Illustrates Uneven, Perhaps Violent Uplift.
10. Folded Rock-Layers, Anticline. Canada. Illustrates Uneven Uplift.
11. A Plateau Region that has been Re-elevated. Also Illustrates the Cutting Power of Water. Diagram of Inner (Younger) and Outer (Older) Gorge of Colorado River.
12. A Plateau Region that has been Re-elevated. Upper Cataract Creek, Near Big Canon of the Colorado. Ariz.
13. A Limestone Plateau, Australia. Illustrating Even Uplift and Subsequent Carving by Erosion.
14. Section of a Volcano in Action. Illustrating Violent Upheaval of Earth's Crust and How a Volcano Forms Its Cone.
15. An Active Volcano. Mt. Vesuvius in Eruption.
16. Ash and Lava Cone. Volcanic Neck (Small Protuberance on Side where Lava Tried to Force its Way). Mt. Vesuvius.
17. An Extinct Volcano. Mt. Shasta, Cal.
18. A Mountain Range of Volcanic Origin. Snowy Range. Andes Mountains.
19. A Mountain Cascade. Illustrating How Mountains are Worn Away. Also Illustrates Syncline.
20. Mt. St. Gothard. Partly Covered with Snow. Illustrates How Mountains are Worn Away by Action of Ice, Snow, etc.
21. A Peak of the Himalayas. Illustrates Young, Unworn Mountains. High, Rugged, Cloud-Girted.
22. The Alleghenies, Penn. Illustrates Old, Worn Down Mountains. Comparatively Low. Tree Covered, with Soft Rounded Outlines. Fertile Valleys at Base Formed by Disintegrated Rocks.

LESSON 1668.

THE WEARING AWAY OF THE LAND. No. 1.

Agencies: Changes in Temperature, Glaciers, Wind, Waves, Surface and Ground Water.

1. Diagram Showing the Wearing Down of What Was Once a Mountainous Region to a Comparatively Level Plain.
2. Vertical Section of Vermillion Cliffs, Utah, Showing Resistance of Harder Rocks to Erosive Agents.
3. Work of Plants in Breaking Up Rocks. Roots Splitting Shale. N. Y.
4. Weathering of Granite Boulders.

Smooth Rounded Outlines. Graniteville, Mo.

5. Rocks Worn By Wind Blown Sand. Col.

6. Pinnacle in Kanab Canon, Col., Illustrating Resistance of Harder Rocks.

7. Undercutting in Horizontal Rocks. Cliff Dwellings, Ariz.

8. Bay Eroded by Sea in Slate Beds Scotland.

9. An Overhanging Sea Cliff, Orkney Islands.

10. Cave eroded by the Wind in a Sand Hill. Arid Climate, Ariz.

11. Talus Cones, Wyo.

12. Great Talus Cone in Valley of Chamounix. Viewed from a Spur of Mt. Blanc.

13. Alluvial Fan. Waterfall. Bergen, Norway.

14. Snow Fields and Glacier. Alps.

15. Crevasse in Glacier. Allows Large Boulders to Drop to Bottom of Glacier. How These Grind and Scar the Rocks.

16. Rock Scarred by Action of Past Glacier. Iowa.

17. Plateau Region Carved by Action of Water and by Weathering.

18. Au Sable Chasm, N. Y. Illustrating Cutting Power of a Stream with Very Little Weathering of Sides.

19. Grand Canon of the Colorado. Illustrating Power of Stream. Little Weathering of Sides Owing to Dry Climate.

20. An Almost Level Region That Was Once Mountainous, Peneplain, Mass.

21. Section Showing Formation of Caverns in Limestone. Effect of Underground ..ater.

22. Entrance of Underground River. Eng.

23. Stalactites and Stalagmites. Manitou, Grand Cavern. Col.

24. Stalactites and Stalagmites Forming Solid Pillars. Jenolan Caves. Australia.

25. Natural Bridge. Virginia. Formed by Action of Underground Water.

26. Lower End of Niagara Gorge at Escarpment.

27. General View of the Yahtse Gravel Delta.

LESSON 1669.

THE WEARING AWAY OF THE LAND. No. 2.

Agencies: Changes in Temperature, Glaciers, Wind, Waves, Surface and Ground Water.

1. Diagram Illustrating the Wearing Down of What Was Once a High, Rugged Mountain Region to a Lower Level. Resistance of Harder Rocks.

2. Action of Frost in Splitting and Jointing Rocks.

3. Work of Plants in Breaking Up Rocks. Roots Splitting Granite. Mo.

4. Weathered Sand Stone. Soft, Rounded Outlines. Col.

5. Cathedral Spires. Col. Illustrating Resistance of Hard Rocks to Weathering.

6. Eroded Sand Stone. Weathering of Rocks Not Equally Hard Throughout.

7. Unconformity in Wind-Blown Sand. Strata at Different Angles. Bermudas.

8. Island Pierced Through With Blow Holes. Orkney Islands.

9. Temple Half Buried by Sand Blown From Desert. Egypt.

10. Stacks of Duncasby. Scotland. Illustrating Resistance of Hard Rocks to Wave Action.

11. Talus on Side of Mountain. N. M.

12. Castle in Danger of Landslip. Ireland.

13. Alluvial Fan. Placer Mine. Mont.

14. Earth Columns. Illustrating Action of Surface Water. N. M.

15. Plateau Section Carved by Action of Running Water and Weathering. Point Sublime. Grand Canon. Ariz.

16. Crand Canon of the Colorado. Ariz. Illustrating Cutting Power of Stream. Little Weathering of Sides Owing to Dry Climate.

17. Work of Glaciers. Monte Rosa. Swiss Alps. Moraine.

18. Boulders Deposited by an Old Valley Glacier. Cal.

19. Fields of Residual Clay. Grinding Up of Rocks Produces Soil. Fertile Hillsides. Va.

20. Action of Underground Water. Porosity in Limestone Rock Due to Solution.

21. Sink-hole in Limestone Cave Region. Ky.
22. Stalactites and Stalagmites. Manitou Grand Cavern. Col.
23. Stalactites and Stalagmites. Forming Solid Pillars. Luray Cavern, Va.
24. Vertical Section of a Region Containing Artesian Wells. Well Spouting at Surface.
25. Natural Rock Bridge—Virginia.

LESSON **1670.**

THE ZONES. No. 1.

1. Map of Western Hemisphere. Locate Zones.

(a) Frigid Zone.

2. Snow and Ice-Covered Mountain. Mt. St. Elias from West. Alaska.
3. Open Sea. Iceberg.
4. Ship Caught in Ice. Off Cape Hooper, Greenland.
5. Men With Sleigh and Dogs. Greenland.
6. An Eskimo of Eta Close. Greenland.
7. Eskimo Child Dressed in White Fur. Greenland.

(b) Temperate Zone.

8. Avenue of Elms, Yale College, Conn. Typical Foliage.
9. Extensive Grain Fields. Grain Piled in Stacks. Washington.
10. Giant Rose Bush in Bloom. California.
11. Shepherd and Dog Tending Flock of Sheep. France.
12. Cow.
13. Horse.
14. Deer.
15. Trees Covered With Ice and Snow. Winter in Temperate Zone.

Sub-Tropical Belt.

16. Cotton Pickers. La. Negro Children in Cotton Fields.
17. Picturesque Negro Cabin. Ga. Log Cabin. Group in Doorway.
18. Mahogany Tree, Bermuda Islands.
19. A Tropical Jungle. Palm Beach. Florida.

(c) Torrid Zone.

20. Native Hut Raised From Ground. Thatched Roof. Palm Trees. Costa Rica.
21. Cactus Tree and Native Hut. Guatemala. Rush or Grass Curtain Hangs from Roof. Native in White Cotton Costume.
22. Street Scene. Natives in Costume. Roof Gardens on Right. Assuit, Egypt.
23. Carib Indians of the Upper Orinoco Valley, Venezuela. Scant Costumes.
24. Desert of Sahara. Camping in the Desert. Sand Dunes.
25. "Ship of the Desert." Camel With Pack and Riders Resting. Egypt.
26. Royal Bengal Tiger in Captivity.
27. Lion in Captivity.

LESSON **1671.**

THE ZONES. No. 2.

(a) Frigid Zone.

1. The Midnight Sun. North Cape.
2. Among the Ice-Floes. Icebergs in Distance.
3. Small Danish Settlement. Noaswak, Greenland.
4. Ships on the Ice at Upernevik. Northernmost Danish Settlement in Greenland.
5. Two of the Danish Governor's Children. One has String of Dead Birds.
6. Four Native Eskimo Girls.
7. Eskimo Dogs. Tent Covered With Skins, and Eskimos in Distance.
8. Seal on Ice.
9. A Young Polar Bear in a Barrel.

(b) Temperate Zone.

10. Typical Scenery. Forest Trees. Peak of Ben A'an in Distance. Scotland.
11. A Woodland Scene. Rude Bridge Over Stream. Yorkshire, England.
12. View of Farm Yard. Cattle.
13. Winter in Temperate Zone, Icicles on Trees.
14. Elk in Captivity. Fairmount Park. Philadelphia.
15. Hampshire Down Sheep.
16. Sheep Ranch in Desert. Utah.
17. Shepherd Dog.
18. Prairie Dog.

19. Whip-poor-Will.

Sub-Tropical Belt.

20. Orange Grove. Trees with Fruit. Jacksonville. Fla.

21. Cutting Sugar Cane. Women in Field. La.

22. Making Palmetto Hats. Woman Weaving Hat by Hand. Child near by. Palm Beach, Fla.

Torrid Zone.

23. Palms and Huts near Las Palmas. Temasopo Canon. Mexico.

24. Native Hut Raised from Ground. Roof Thatched with Banana Leaves. U. S. of Colombia.

25. Forest with Ferns. Australia.

26. National Palace. City of Mexico. Balconies. Large Windows. Tropical Plants.

27. Roof Dwellings. Mexico.

28. Caravan Crossing the Desert. Dead Camel in Foreground.

29. Palm Trees. Canoe Loaded with Bananas. Natives. Children in Foreground. Costume Very Scant. Fiji Islands.

30. Tiger Roaring.

31. Asiatic Lion.

LESSON **1672.**

ELEMENTARY PHYSICAL GEOGRAPHY.

1. Map of Asia in Relief. Illustrates Forms of Land and Water; Lakes, Islands, Peninsulas, Mountain Ranges, River Basin, Divide, etc.

2. Folded Rock Layers, Md. Illustrates Upheaval of Earth's Crust*

3. Mt. Vesuvius. Lava in Foreground. Illustrates Violent Upheaval of Earth's Crust.

4. The Damming of a Valley by Lava, Forming Two Lakes. Cal.*

5. Japanese Earthquake. Buildings in Ruins. Relation of Earthquakes to Volcanoes.

6. Grand Geyser. Yellowstone Park. Another Illustration of Internal Heat of Earth.

7. Pulpit Terraces, Yellowstone Park Formed by Deposit of Mineral Matter Held in Solution by Hot Water.*

8. Aletsch Glacier, Switzerland. Sixteen Miles in Length. Illustrates the Grinding and Wearing Away of Mountains by Ice and Snow.*

9. Talus Slope, Devil's Lake, Rocky Mts. Illustrates Erosion.*

10. Sand Dune on the Shore of Lake Michigan. Action of Wind and Water in Building up Land.*

11. Dune Covered Forest Being Uncovered Again. Cape Ann, Mass. Action of Wind.

12. Wind Blown Sand, Showing Stratification. Bermudas.

13. Petrified Trees. Yellowstone Park. Wyo.

14. Deep Gorge Cut by a Rapidly Flowing Stream, Niagara River. Falls in Distance.

15. American Falls from Goat Island, Niagara.

16. A Wide and Comparatively Shallow River Valley, N. Y.*

17. A Wide, Shallow and Very Fertile River Valley. Vale of Monteith, Scotland. Farms. Buildings.

18. Natural Bridge, Yellowstone Park. Illustrates Work of Underground Water.*

19. Islands on Maine Coast. Illustrates Sinking Coast.*

20. Promontory on Maine Coast*

21. Bass Head, Me. High and Rocky Coast. Light House.*

22. Bay of Rio Janeiro. Dyke in Granite. Illustrates Bay.

23. A Norwegian Fiord.*

24. Sandy Hook, New Jersey. Building up of a Bar by Contrary Currents.*

25. Great Barrier Coral Reef, Australia. Work of Animals in Building up Land.*

26. Sea Shore View. Morning. Sun Reflected in Water. Flat Sandy Beach. Bathers. Bath House on Wheels.

27. Sea Shore View. Rocky Coast. Waves Dashing Against Rocks.

28. Mid-Ocean View. Quiet Weather. Sunset on the Atlantic.

29. Dissolving—Frost King.

* From Natural Advanced Geography

LESSON 1673.

ELEMENTARY GEOLOGY.

1. Crust of the Earth. Circle Showing Relative Thickness of Crust Compared to Interior Mass.

2. Relief Map of Europe. Showing Appearance of Surface of Earth's Crust.

3. Segment of Earth's Surface, Showing Curvature, and Relative Height of Mountains Compared to the Whole Mass.

4. Diagram of Geological Ages, viz.: Eozoic, Paleozoic, Mesozoic Cenozoic and Psychozoic. Also the Periods when the Various Forms of Vegetable and Animal Life First Appeared and their Relative Extent.

5. Vertical Section of Earth's Surface across Region of Alps. Shows the Upheaval of Rock Layers and the Work of Erosion in Uncovering Some of the Lower Strata.

6. Vertical Section of Canon of the Colorado. Shows How the Water has Cut a Deep Gorge through the Rock Layers that Form Earth's Crust. Lowest Rock Exposed is Granite.

7. Pinnacle in Canon of the Colorado. Showing Resistance of Harder Rocks to Erosive Agents.

8. Moran's Point, Near Grand Canon of the Colorado. Shows Action of Water in Cutting Rocks thus Exposing Rock Layers.

9. Fossil Ferns. Evidence of Vegetable Life in Past Geologic Ages.

10. Fossil Footprints of Birds. Some Large, Others Small. Evidence of Animal Life in Past Geologic Ages.

11. Skeleton of Tinoceras—Extinct Animal.

12. The Mammoth, Restored. Extinct Mammal.

13. Ichthyosaurus, Plesiosaurus and Pterodactyl, Restored. Extinct Reptiles.

14. Pterichthys, Coceostes, and Cephalaspis. Skeletons and Shells. Extinct Fishes Found in Devonian or Old Red Sandstone Formation.

15. Trilobites, Crinoids, and Ammonites. Extinct Sea Animals whose Shells are Found in Various Geologic Strata.

16. Orbulina.

17. Skeleton of Iguanoden.

LESSON 1674.

ATMOSPHERIC AGENTS AND PHENOMENA.

Wind, Heat Clouds, Rain, Ice, Electricity.

ICE, ELECTRICITY.

1. Circulation of Atmosphere. Diagram of Earth Showing Belts of Prevailing and Variable Winds and Calms.

2. Map Showing July Isobars and Prevailing Winds.

3. Map Showing January Isobars and Prevailing Winds.

4. A Tornado at Sea. A Waterspout.

5. Storm Waves Beating against a Granite Coast. Shipwreck.

6. Wind-blown Sand Dunes. Cape Ann, Mass.

7. A Tornado on Land. Effects of Cyclone on Lafayette Park, St. Louis, May 27, 1896.

8. A Tornado on Land. Effects of Cyclone on Residences near Lafayette Park, May 27, 1896.

9. Effects of Sun's Heat on the Matterhorn—Melting of Snow.

10. Effect of Sun's Heat on Water in Warm or Moderate Climates—Evaporation, Formation of Clouds.

11. Classes of Clouds—Cirrus and Cumulus.

12. Classes of Clouds—Cumulus.

13. Classes of Clouds—Stratus.

14. Classes of Clouds — Strato — Cumulus.

15. Sunset Clouds (Colored).

16. Sunset Clouds (Colored).

17. Map of the Two Hemispheres Showing Distribution of Rainfall.

18. Vermillon Cliffs, Utah, Illustrating Erosion of Earth's Surface by Atmospheric Agents.

19. Ice and Snow Effects. Frost on Larches.

20. Ice and Snow Effects. December at the Docks.

21. Ice and Snow Effects. Ice Flowers on Moritz Lake, Switzerland.

22. Ice and Snow Effects. Ice Flow-

ers and Hoar Frost on the River Inn, Switzerland.

23. Sheet and Forked Lightning.

24. Flash of Lightning in Woods.

25. Electrical Storm. Coast. Sailing Vessel.

26. Franklin and His Kite. Identification of Lightning with Electricity.

27. Opening Clouds—(Colored).

28. Lightning—(Dissolving Only).

LESSON **1675.**

AGRICULTURE, OR OUR BREAD, AND HOW WE GET IT.

1. Three Great Cereals. Wheat, Oats and Rye.

2. Map of United States. Showing Wheat Area.

3. Plowing. Small Farm. Two Horses Pull Plow while Farmer Guides It.

4. Plowing. Gang Plows. Red River Valley Farm, N. D.

5. Harrowing. Small Farm. Two Horses Pull Harrow While Farmer Guides It.

6. Harrowing. Long Row of Harrows. Red River Valley Farm, N. D.

7. Sowing. By Hand. Small Farm.

8. Sowing (Drilling). Red River Valley Farm, N. D.

9. Reaping. Small Farm. Ordinary Reapers.

10. Reaping. Self-Binders. Red River Valley Farm, N. D.

11. Threshing. Horse Power. Small Farm.

12. Threshing. Steam Thresher. Red River Valley Farm, N. D.

13. Loading Grain. Tacoma, Wash.

14. The Flour Mill. Small Mill, Run by Water Power.

15. Pillsbury Flour Mills, Minneapolis, Minn. Largest Flour Mills in the World.

16. The Bake House.

17. Bread Ready for the Oven.

18. The Oven.

19. Baker's Shop.

LESSON **1676.**

TEA AND COFFEE.

1. Coffee Tree in Blossom. Costa Rica.

2. Drying Coffee. Background of Palms. Mexico.

3. Natives Sorting Coffee. Costa Rica.

4. Tea Plantation.

5. Clearing an Old Tea Plantation.

6. Pruning Tea Plants.

7. Picking Tea.

8. Natives Weighing Tea in Large Baskets.

9. Fermenting Tea.

10. Tea in Large Ovens during Firing Process.

11. Withering. Tea Spread on Large Racks.

12. Pressing. Machines in Operation.

13. Sorting Tea through Large Sieve.

14. Packing. Weighing Tea. Packing Tea in Boxes. Boxes of Tea in Background.

15. Shipping Tea. Boxes of Tea being Loaded on Ship by Means of Derrick.

16. Tea Shop and Warehouse.

17. The Tea Table. Interior of House. Children at Table. Mother Pouring Tea.

18. Tea House and Garden. Japan. Natives in Costume. Jinrikisha in Foreground (Native Two-Wheeled Carriage Pulled by One or Two Men.

LESSON **1677.**

COAL MINING OR UNDERGROUND LIFE.

1. Vegetable Origin of Coal, Lignite, Peat, etc. Lake Filling up with Vegetation. Adirondacks.

2. Peat and Peat Mosses. England.

3. Cutting Peat in New Jersey.

4. Forest of the Coal Period. An Imaginary View.

5. General View of Colliery. Power House, Shafts, etc.

6. Mouth of Shaft. Tracks. Empty Cars being Placed in Elevator.
7. Bottom of Shaft. Elevator with Two Stories. Miners with Lamps. Coal Car in Right Corner. Electric Lights.
8. Undercutting Coal. Miners Working Prostrate on Ground.
9. Cutting the Bottom Layers of Coal. Miners Standing. Working with Pickaxes.
10. Cutting Top Coal. Miner on Ladder
11. Drilling with a Machine.
12. Loading Large Coal
13. Fixing Short Timber Props.
14. Fixing Long Timber Props.
15. Effect of Pressure on Masonry and Timber. Mine Threatens to Cave In.
16. Haulage by Horses.
17. Testing for Gas.
18. Intrusion of Basalt in Coal. Part of Wall with Veins of Basalt.
19. Limestone Mining. Showing Pillars of Stone Left as Props.
20. Underground Stables.
21. Meal-time Underground.

LESSON **1678.**

COTTON.

1. Map of United States. Showing Cotton Area.
2. Among the Cotton. Negroes in Field. La.
3. Topsy among the Cotton. La. Little Colored Girl.
4. Home of a Cotton Picker. Miss. One-Story Cabin.
5. Bringing in the Cotton. Storing it in Log House. La.
6. A Cotton Gin. Exterior of Rude House. Boiler Under Shed.
7. Cotton Press Yard. Cotton Packed in Bales. New Orleans, La.
8. Cotton at Railroad Station. Packed in Bales.
9. Cotton Levee. Ready for Shipment. Ocean Steamer. Mississippi River. New Orleans, La.
10. Cotton Factory. Fall River, Mass. (Iron Mills) Steam Power.
11. Cotton Factory. Cotton House. Fall River, Mass.
12. Cotton Factory. Rear. Covered Bridge Connecting Buildings. Fall River, Mass.
13. Cotton Factory. Carding Room. (English Cards). Fall River, Mass.
14. Cotton Factory, Carding Room. Fall River, Mass.
15. Cotton Factory, Spinning Room. Fall River, Mass.
16. Cotton Factory. Weaving Room. Fall River, Mass.
17. Cotton Ready for Sale. Interior Wholesale House, St. Louis.

LESSON **1679.**

MANUFACTURE OF PLATE GLASS. PITTSBURG PLATE GLASS CO.

1. Casting Plate Glass.
2. Rolling Plate Glass.
3. Storing the Hot Rolled Plate.
4. Carrying Rough Plate Glass.
5. Grinding the Rough Plate Glass.
6. Polishing the Ground and Smooth Plate Glass.
7. Carrying the Finished Glass.
8. Looking for Defects and Cutting Plate Glass.

LESSON **1680.**

SILK AND HOW WE GET IT.

1. How Silk Worms are Reared.
2. Gathering Mulberry Leaves.
3. Branch of Mulberry Tree.
4. Worms Eighteen Days Old.
5. Transferring the Worms.
6. Worms Eating.
7. Position in Molting.
8. Worm Suspended by Its Silk.
9. Worm Preparing to Form Its Cocoon.
10. Worm Nearly Hidden from View.
11. Completed Cocoon.
12. Bundle of Straw in Which Worms Have Spun their Cocoons.
13. Moths Emerging from Cocoons.
14. Moths and Empty Cocoons.
15. Preparing Cocoons for Reeling.
16. Silk Reeling Machines.

LESSON 1681.

MANUFACTURE OF LINEN.

1. Flax Plant. Flowers, Buds, Leaves.
2. Spinning Mill. Exterior. Field of Flax in Foreground.
3. Bale of Rough Flax.
4. "Striking Up." Separating the Flax into Handfulls so as to be More Easily Handled.
5. Spinning Frame.
6. Spinning Wheel. Old Fashioned Method.
7. Reeling Machine. Girls at Work.
8. Washing Reels and Squeezing Machine.
9. Bleaching Yarn on Grass.
10. Lorry with Load of Yarn.
11. Warping.
12. Jacquard Loom.
13. Damask Hand Loom.
14. Inspecting Cloth.
15. Damping Machine.
16. Hydraulic Mangle.
17. Bale of Linen under Pressure.
18. Bale of Linen Ready for Export.

LESSON 1682.

LUMBERING AND MINING.

1. Map of United States. Forest Area.
2. Felling Trees in Maine. Winter.
3. Logging Camp. Teams. Crew Maine.
4. Schooner Loading Mahogany Logs. Mexico.
5. Booming Timber Over a Dam. Kinnickinnick Falls, Wis.
6. Log Jam. New Brunswick.
7. Timber Raft. Canada.
8. Butting Timber. Ottawa, Canada.
9. Timber Slide. Ottawa, Canada.
10. A Backwoods Saw Mill. Washington.
11. Pioneer Saw Mills, Driven by Water Power. Minneapolis. Rapids of St. Anthony.
12. Lumber Stacks. Canada.
13. Map of United States. Iron Area
14. Map of United States. Coal Area
15. Train Coming out of a Coal Mine. Mauch Chunk, Pa.
16. Coal Miner's Cabin. Pa.
17. Gold Mine. Underground. Men at Rest. Australia.
18. Panning. Alluvial Gold Diggings. Australia.
19. Gold Nuggets. Mont.
20. Melting Gold. Assay Office. Helena, Mont.
21. Natural Oil Well. Linesville, Pa. Shed over Machinery. Forest.
22. Oil Derricks. McDonald, Pa.
23. Cleared Land—Adirondacks.
24. Placer Mining near Dawson City.

LESSON 1683.

HUNTING FISHING AND HERDING.

1. Hunters' Camp. Canada. Evening. Men Sitting around Camp Fire Smoking. Pine Forest in Background. Tent on Right.
2. Hunting in the Arctic Regions. Eider Ducks in Water.
3. Snaring Eider Ducks. Net Stretched across Field.
4. A Day's "Bag." Game Piled on Deck.
5. Hunting the Buffalo on a Western Prairie. Indian Shooting Buffalo with Bow and Arrow.
6. Hunting the Buffalo. Dead Buffalo in Foreground. Hunter Standing Near. Horse in Background.
7. Family of Seal on Shore. Summer Scene in Alaska.
8. A Drove of Seals Being Driven to the Killing Ground. St. Paul, Alaska.
9. Drying Seal Skins. Rude House. Skins Stretched on Frames. Some Folded and Resting on Horizontal Bars. Woman Sitting near House.
10. "Making off" Walrus Skins. Scene on Deck of Ship. Men Stripping Skins off Walrus.
11. Whaling. Whalebone Hanging on Deck. Men Standing Near.
12. Going Out to Sea. Men in Sail Boats. Fishing Village in Distance. Newfoundland.

13. A Catch. Fish in Fore round. Group of Men. Boats in Background. Newfoundland.

14. Salting Fish. Men Rubbing Salt on Fish. Fish Spread Out to Dry. Newfoundland.

15. Drying Fish. Fish Spread in Rows to Dry. Men at Work. Hills in Background. Newfoundland.

16. Forking Out the Catch. Man in Boat Fishing with Pronged Pole. Houses in Distance. Newfoundland.

17. Salmon Fishing. Columbia River. Man Fishing with Net. Another Has a Club in Hand Ready to Strike Fish when it Rises. Rocky Stream Bed. Rapids.

18. Salmon in Cannery. Fish Spread on Lattices to Drain. Astoria. Oregon.

19. Trout Fishing. Men Fishing with Line and Pole. Trout Caught Spread on Bank. Yellowstone Park.

20. Sharks Captured at Barbados. Scene on Shipboard. Jamaica.

21. Indians Catching Wild Horses. Indian in Foreground Has Dismounted and is Lassooing Wild Horse. Snow-capped Mountains in Distance.

22. Horse Ranch. Showing Buildings, Pastures, Hay Stacks, Wind Mill to Draw Water from Well. Horses in Paddocks. Mountains in Distance.

23. Sheep Ranching Scene. Large Flock of Sheep Feeding in Pasture. Men on Horses in Background. Alberta, Canada.

24. Branding Cattle. Two Men Hold Calf While One Brands it with Hot Iron. Alberta, Canada.

25. Round Up. Cow Boys on Horses. Texas.

26. Wild West Butcher Pen. Cow Boys, Some on Donkeys. Rack with Pulleys to Hoist Carcasses for Dressing Horns and Skulls in Foreground.

LESSON 1684.

ASTRONOMY.

1. Sun Spots. Their Appearance at Different Times. Showing Changes.

2. Saturn and His Rings. Top View.

3. Jupiter and His Moons Seen from the Earth. Partial Eclipse of Jupiter by one of His Moons.

4. Apparent Direct and Retrograde Motion of Venus and Mercury. Also their Stationary Appearance. (Rackwork.)

5. The Eccentric Revolution of a Comet Around the Sun and the Appearance of Its Tail at Different Points of its Orbit (Rackwork).

6. Donati's Comet.

7. Orion and Neighboring Constellations.

8. Visible Heavens from January 21st to April 17th.

9. Visible Heavens from November 1st to January 28th.

LESSON 1685.

ASTRONOMICAL GEOGRAPHY.

1. The Solar System, Showing the Revolution of all the Planets with their Satellites around the Sun. (Rackwork).

2. The Earth's Rotundity, Proved by a Ship Sailing Round the Globe and a Line Drawn from the Eye of an Observer placed on an Eminence. (Rackwork).

3. The Diurnal Motion of the Earth, Showing the Rising and Setting of the Sun, Illustrating the Causes of Day and Night by the Earth's Rotation upon its Axis. (Rackwork).

4. The Earth's Annual Motion Around the Sun, Showing the Parallelism of its Axis Producing the Seasons. (Rackwork).

5. Diagram Showing Position of Earth in Relation to Sun during Different Months and Seasons of the Year. Equinoxes. Solstices.

6. A Characteristic Spring Scene. Pear Trees in Bloom near Kirkwood, Mo.

7. A Characteristic Summer Scene. Hay-making. Hay Field. Wooded Bluff.

8. A Characteristic Autumn Scene. Sugar Creek near Kirkwood, Mo. Trees Bare of Leaves. Grassy Bank. Children Crossing Stream.

A Characteristic Winter Scene. Forest Park. Birch Trees in Distance Covered with Ice and Snow. Oak Trees on Right. Heavy Snow on Ground.

10. Annual Motion of Earth Around Sun. Moon Revolving Around Earth Showing Monthly Lunations. (Rackwork).

11. The Various Eclipses of the Moon—Partial, Total and Annular. (Rackwork).

12. The Various Eclipses of the Sun —Partial and Total. (Rackwork).

13. Partial Eclipse of the Sun, May, 1900. View Taken in St. Louis.

LESSON 1686.

ASTRONOMICAL DIAGRAMS.

1. Rotundity of the Earth Proved by Ship Sailing Around the Globe. Line Drawn from Eye of an Observer on an Eminence. (Revolving).

2. 1. Signs of the Zodiac Arranged in Circle around the Sun. Orbits of Mercury, Venus and the Earth Shown. 2. The Solar System. Sun in Center. Orbits of Mercury, Venus, the Earth, Mars, Jupiter and Saturn. The Earth is Shown in Four Different Positions Corresponding to the Four Seasons. 3. Spring Tides, Earth, Moon and Sun. The Last two in Conjunction. 4. Spring Tides. Earth Moon and Sun. The Last two in Opposition.

3. 1. Neap Tides. Earth, Moon and Sun. Last two at Right Angles to Each Other. 2. Constellation of Orion, the Hunter. (a) Figure of Hunter, (b) Arrangement of Stars in Constellation. 3. Ursa Major, the Great Bear. Figure of Bear.

4. 1. Comet of 1811. 2. Comet of 1680. 3. The Solar System According to Ptolemy, Earth in Center, with Sun, Moon, Planets and Stars Revolving around It. 4. The Solar System According to Pythagoras and Copernicus. Sun in Center with Mercury, Venus, the Earth, Mars, Jupiter and Saturn Revolving around It.

5. 1. The Solar System According to Tycho Brahe. Earth in Center with Sun, Moon and Stars Revolving Around It. Around Sun Revolve Mercury, Venus, Mars, Jupiter and Saturn. 2. Solar System According to Newton. Like the Copernican or Pythagorean, with the Addition of Two More Planets (Uranus and Neptune) and Comets with Eccentric Orbits Revolving Around the Sun. No Special Reason for Calling it Newtonian. 3. Shadow Cast by the Earth if the Latter Were Larger than the Sun. 4. Shadow Cast by the Earth if the Latter Were Same Size as Sun.

6. 1. Shadow Cast by the Earth. Latter is Many Times Smaller than the Sun. 2. Total Eclipse of the Moon. Latter is Supposed to be in Earth's Shadow and is Consequently Invisible. 3. Total Eclipse of the Sun. 4. Orbit of the Moon with Relative Position of the Sun and Principal Planets.

7. Eclipses of the Moon. 1st Partial —Small Portion of Moon's Disk is Covered by Earth's Shadow. 2nd Partial—Moon's Disk Almost Entirely Covered. 3rd Total—Moon's Disk Entirely Covered.

8. Eclipses of the Sun. 1st Partial —Small Part of the Sun's Disk Covered by Moon's Disk. 2nd Partial—One-Half of Sun's Disk Covered. 3rd Total —Sun's Disk Entirely Covered.

9. Phases of the Moon. 1. View in Mid-Ocean. Moonlight. Moon's Face Partly Hidden by Clouds. Two Sailing Vessels. 2. Moon's Disk Full Moon— Irregularities of Moon's Surface Shown. 3. Half Moon. 4. Crescent Moon.

10. 1. Moon's Phases. Earth, Sun and Moon's Orbit with Moon in Eight Different Positions Showing Various Phases. 2. Sun's Disk. Different Sizes Due to Different Distances at Which it is Viewed. 3. Phases of Mercury —Full, Half and Crescent. 4. Phases of Venus. Full, Half and Crescent.

11. 1. Mars. Red Disk Showing Irregularities of Surface. 2. Four Asteroids and Part of Their Orbits. 3. Jupiter and Its Four Moons. 4. Saturn and Its Seven Moons. Oblique View of Rings.

12. 1. Saturn and Its Seven Moons. Edge View of Rings. 2. Uranus and Its Six Moons. 3. Neptune and Its Two Moons and Ring. 4. The Orbit of a Comet.

13. The Starry Heavens. Stars of Different Magnitude. Nebulae. The Milky Way.

LESSON 1687.

ASTRONOMY.

1. Halley's Comet on the Bayeaux Tapestry.
2. Diagram of the Orbit of Halley's Comet.
3. Halley's Comet as it Appeared in 1835.
4. Tycho Brahe and his Observatory.
5. Diagram showing Kepler's Law of Equal Areas.
6. A Chronograph.
7. Diagram showing How to Find Height of an Object above a Table.
8. Diagram Showing how to find the Distance of a Body from the Earth.
9. Lick Observatory.
10. Lord Rosse's Telescope.
11. View of the Full Moon.
12. View of the Moon past Last Quarter.

LESSON 1688.

ELEMENTARY BOTANY.

1. Parts of a Plant. Leaf, Root, Flower, etc.
2. Various Forms of Germination.
3. Various Forms of Roots.
4. Banyan Tree.
5. Mangrove Swamp.
6. Buds and Leaves — Various Forms.
7. Flowers and Inflorescence.
8. Stamens and Pistils.
9. Chickory and Calliopsis—Flowers.
10. Exogenous Structure. Germination Leaves. Section of Trunk, and Stem.
11. Deciduous Trees, Oak Tree, Leaves. Sections of Trunk and Stem.
12. Evergreen Trees, Fir Tree, Leaves, Flower, Fruit.
13. Anenome, Rue Flowers and Leaves.
14. Spring Beauty, Flowers and Leaves.
15. Buttercup. Flowers and Leaves.
16. Black-eyed Susan. Flowers and Leaves.
17. Poison Ivy. Spray of Leaves.
18. Apple Blossom. Flowers and Leaves.
19. Dandelions. Flowers, Leaves, Fruit.
20. Red Sumach. Fruit and Leaves.
21. American Holly. Fruit and Leaves.
22. Willow (Cat-tails). Stalk and Fruit.
23. Lily Pond—Victoria Regia, Tower Grove.
24. Endogenous Structure.

LESSON 1689.

SOME PLANTS AND TREES USED AS FOOD, CLOTHING, MEDICINE, IN BUILDING, ETC.

1. Strawberry. Flower, Fruit and Leaves.
2. Almond. Flower, Fruit and Leaves.
3. Vanilla. Flower and Leaves.
4. Cocoa. Flower, Fruit and Leaves.
5. Coffee. Flower, Fruit and Leaves.
6. Railroad through Coffee Forest, Temasopo Canon, Mexico.
7. Pine Apple. Fruit.
8. Peruvian Bark. Flowers and Leaves. (Medicinal).
9. Moth Mullein Flower and Leaves. (Medicinal).
10. Tobacco. Flower and Leaves. (Injurious).
11. Pulque or Maguey Plant, Mexico. (Injurious).
12. Garden in New Mexico, Showing Manner of Cultivating Small Plants.
13. Picking Cotton in Louisiana. Negroes.
14. Sugar Cane Fields, Louisiana.
15. Planting Rice. Japan.
16. Rice Fields. Japan.
17. A Large Oak Tree.
18. Mahogany Tree. Bermuda Islands.
19. Cedar Avenue. Bermuda Islands.
20. Pepper Tree. Santa Barbara, California.

21. Orange Tree (with fruit), Rockledge, Florida.
22. Lemon Tree (with fruit), Pasadena, California.
23. Banana Tree (with fruit), Palm Beach, Florida.
24. Group of Cocoanut Palms, Bermuda Islands.
25. Date Palm, Africa.
26. Fig Tree, Bahama Islands, Nassau.
27. Bread Fruit Tree, Bahama Islands, Nassau.
28. Rubber Tree, Bermuda Islands.

LESSON **1690.**

SOME AMERICAN MUSHROOMS.

1. Morchella Bispora.
2. Polyporus Sulphureus.
3. Lactarius Volemus.
4. Woods Inkcap Coprimus Atramentarius Variety Silvestris.
5. Amanita Verna.
6. Amanitopsis Strangulata.
7. Clavoria Pyxidata.
8. Clavoria Coronata.
9. Hydnum Coralloides.
10. Boletus Felleus.
11. Boletinus Porosus.
12. Lycoperdon Gemmatum.
13. Lycoperdon Cruciatum.
14. Lycogola Epidendrum.
15. Peziza or Sarcoscypha Coccinea.
16. Cordoceps Militoris.
17. Geoster Minima.
18. Geoster Hygrometricus.
19. Geoster Soccatus.
20. Cortinarius Violaceus.
21. Sclerotium Tuberosa.
22. Crucibulum Vulgaris.
23. Omphallia Campanella.
24. Sarcoscypha Floccosa.
25. Amanita Rubescens.

LESSON **1691.**

SOME AMERICAN TREES.

1. Exogenous Structure. Germination Leaves. Section of Trunk.
2. White Pine.*
3. White Pine. Spray of Leaves. Cones.
4. Pine Tree, Norfolk Island, Santa Barbara, Cal.
5. Fir Tree.
6. White Oak.*
7. Black Oak. Yellow Bark Oak.*
8. Mammoth Live Oak, Jacksonville, Florida.
9. Chestnut Oak. Spray and Acorns.
10. American Elm. White Elm.*
11. Locust.*
12. Butternut Hickory.*
13. Willow, Osier.*
14. Cedar Tree.
15. Red Maple. Swamp Maple.*
16. Sugar Maple. Rock Maple.*
17. Hard Maple. Spray of Leaves (Autumn Foliage.)
18. Chestnut Tree.
19. Horse Chestnut.*
20. Horse Chestnut. Spray of Leaves.
21. White Ash.*
22. Ash. Spray of Leaves.
23. Lombardy Poplar.*
24. Poplar Leaved Birch. White Birch.*
25. Birch Tree.
26. Hoar Frost on Birch Trees.

* Show Spray of Leaves, Bark of Trunk, Entire Tree.

LESSON **1692.**

TWELVE COMMON EUROPEAN TREES, WITH BUDS, FLOWERS AND SEEDS.

Colored Slides.

1. Locust.
2. White Birch.
3. Black Poplar.
4. Ash.
5. Horsechestnut.
6. Alder.
7. Sycamore Maple.
8. Large-leaved Linden.
9. Common Spruce.
10. White Fir.
11. Evergreen or Holly Oak.
12. English Walnut.

LESSON **1693.**

ANIMALS.

(a) Mammals.

1. Baby Camel.
2. Camel with Bedouin, Equipped for Desert Journey.
3. Hippopotamus.
4. Reindeer.
5. Giraffe.
6. Brown Bear.
7. Polar Bear.
8. Vampire Bat.
9. Seal.

(b) Birds.

10. Bird of Paradise and Blue Gail.
11. Baltimore Oriole. Nest.
12. Virginia Owl.
13. Kingfishers (Fishing).
14. Ruffed Grouse.
15. Blue Jay.
16. Imperial Eagle.
17. Green Parrot.
18. Humming Birds.
19. Pelicans.

(c) Reptiles.

20. Alligator.
21. Bull Frog.
22. Rattlesnake.
23. Boa Constrictor. Keeper has Him Wound About His Neck.

(d) Fishes.

24. Shark.
25. Flying Fish.

(e) Insects.

26. Harlequin Beetle.

LESSON **1694.**

ANIMALS THAT ARE OUR FRIENDS.

1. Ducks in Stream. Overhanging Foliage.
2. Geese in Water. Foliage.
3. Cock Crowing. Hen.
4. Ducklings in Water. Hen on Bank Anxiously Watching Them.
5. Turkeys.
6. Blackbirds in Nest.
7. Ewe and Two Lambs.
8. Goat and Two Kids.
9. Farmyard. Cows.
10. Cows in Stream. Summer.
11. Jersey Cow.
12. Donkey. Boy Seated in Saddle. Lasso.
13. Three Mares and Foal. Pasture.
14. Horse and Ox Drawing Plow. Man Guiding.
15. A Famous Race Horse, "St. Simon." Stables.
16. At the Smithy. Shoeing a Horse.
17. Shetland Ponies. Mountain Scenery.
18. A Playful Kitten. Dead Leaves Strewn on Ground.
19. Mastiff.
20. Collie and Two Pups.
21. St. Bernard Dog. Child.

LESSON **1695.**

A VISIT TO A MENAGERIE.

1. Camel.
2. Dromedary.
3. Llama.
4. Group of Elks.
5. Moose.
6. American Buffalo.
7. Black-tailed Deer.
8. White Deer.
9. Polar Bear.
10. Brown Bear. Climbing Pole.
11. White or Common Pelican.
12. Iguanas.
13. Giraffes.
14. Hippopotamus.
15. Great Kangaroo.
16. African Elephant.
17. Mountain Lion.
18. Wild Cat.
19. Leopard.
20. Lion.
21. Royal Bengal Tiger.
22. Chimpanzee.

LESSON 1696.

AMERICAN HISTORY. FROM 1492 TO 1682.

1. House in which Columbus was Born. Genoa, Italy.
2. Landing of Columbus, 1492. Takes Possession of Country in the Name of Ferdinand and Isabella.
3. Landing of Columbus.
4. Balboa Discovering the Pacific. Flag of Castile in His Hand.
5. Cortez Conquering Mexico. Aztec Buildings in Distance. Spaniards in Armor.
6. Cortez Subduing Mutiny in His Army. Indian Captives.
7. Cortez destroying his ships—Opposing Human Sacrifice.
8. Burial Place of Cortez. Interior of Church of Jesus, City of Mexico.
9. De Soto Discovering the Mississippi, 1521. Indians Wigwams. Cannon in Foreground.
10. Burial of De Soto in the Mississippi. Moonlight.
11. Marquette Sailing down the Mississippi. Indian Guides. Birch Bark Canoes.
12. La Salle Taking Possession of Louisiana in the Name of French King. Column with Arms of France.
13. Landing at Jamestown, 1607. Cavaliers.
14. Smith Rescued by Pocahontas, 1607.
15. Marriage of Pocahontas, 1613.
16. Landing of Henry Hudson, 1609.
17. View of Hudson. West Point. Battery in Foreground.
18. Embarkation of Pilgrims from Holland, 1620.
19. The Mayflower, 1620. Mid-Ocean. Rough Weather.
20. Compact of Pilgrims on Board the Mayflower.
21. Landing of Pilgrims, 1620. Mayflower in Distance.
22. Embarkation of the Pilgrims.
23. Landing of the Pilgrims.
24. Plymouth Rock Covered with Granite Canopy. Harbor, Plymouth, Mass.
25. Puritans' First Sunday in America. Snow. Log Fire. Sentinel in Distance.
26. Puritans Going to Church. Snow. Forest. Armed Men Leading.
27. March of Miles Standish against Indians. Friendly Indian Guide Leading.
28. John Alden and Priscilla. Interior of a New England Home. Priscilla is Spinning.
29. Bridal Procession of John Alden and Priscilla. See Longfellow's "Miles Standish."
30. Landing of Roger Williams. Indians Present Pipe of Peace.
31. Settlement at Jamestown.
32. Gov. Stuyvesant Destroying Summons of English to Surrender.
33. Panorama of New York. Brooklyn Bridge.
34. Penn's Treaty with the Indians, 1682. Exchanging Goods for Land.
35. View in Philadelphia, Pa. Independence Hall. Exterior.

LESSON 1697.

COLONIAL HOMES.

1. The "Pines" where Jefferson was married.
2. Home of the Washingtons.
3. The Home of the Fairfaxes.
4. Gov. Berkeley's Residence.
5. A Typical Log Cabin.
6. Slave Quarters.
7. Gen. Nelson's Residence, York.
8. Col. Wm. Byrd's Residence, Westover.
9. The oldest house in New England, 1633.
10. Gov. Bradford's House.
11. The Curtis House, 1639.
12. The Bridgham House, 1640.
13. The Whipple House, 1639. Ipswich, Mass.
14. Rev. Nath. Roger's House, 1727. Ipswich, Mass.
15. King-Hoofer House, 1754.
16. An Ancient House, Long Island, 17th. Century.
17. A House of 1668, N. Y.
18. The Remsen House, 17th. Century.
19. Gov. Dongan's House, N. Y. 1889.
20. The old Schuyler Manor, Albany, 1765.

21. The Van Rensselaer Manor House, 1765.
22. A Cane Dwelling, Philadelphia, 1683.
23. First Brick House in Philadelphia, built by Penn.
24. The Home of the first Mayor (Shippen), Philadelphia.
25. Gov. Markham's House, 1697.
26. Burt Hill Manor, Home of Gov. Hamilton, 1714.
27. The Fairman Mansion, 1702.

LESSON **1698.**

COLONIAL FURNITURE.

1. Candle Moulds.
2. Candle Dipping.
3. Silver Snuffers.
4. Betty Lamps.
5. Old Pewter Lamp.
6. Room (furnished) Whipple House.
6. Room (furnished) in Whipple House.
8. Typical Oak Table, 1650.
9. Pewter Spoon and Spoon Mould.
10. Butterfly Table, 1700.
11. Porringer.
12. Chest with Drawers, 17th Cent.
13. Olive-wood Chest, 17th. Cent.
14. Corner Cupboard, 17th Cent.
15. Corner Cupboard with Tableware, New England, 1740.
16. Leather Chair, 1660.
17. Dutch Chair, 1710.
18. Dutch Chair, 1740.
19. New England Kitchen, 1650.
20. Colonial Kitchen Furnished, Mass.
21. Rush bottom Chairs, 17th Cent.
22. Turned Chairs, 17th. Cent.
23. Turned Chair, 17th. Cent.
24. Potato Boiler, 17th Cent.
25. Old Tinware, 17th. Cent.
26. Skillet, etc., 17th. Cent.
27. Old Clocks, 1720.

LESSON **1699.**

COLONIAL COSTUMES.

1. Baby's Go-cart, 17th. Cent.
2. Child's Dress, 1670.
3. Child's Dress, 1700.
4. Boy's Suit, 1784.
5. Child's Shoes, 17th. Cent.
6. Group of Children, 1754.
7. Slashed Sleeves, 1730.
8. Lady's Dress, 17th. Cent.
9. Doublet, 17th. Cent.
10. Falling Neck band, 17th. Cent.
11. Beaver Hat, 1625.
12. Silk Hood, 17th. Cent.
13. Dutch Costumes, 17th. Cent.
14. Dutch Costumes, 17th. Cent.
15. Dutch Costumes.
16. Dutch Woman's Dress.

LESSON **1700.**

AMERICAN HISTORY. FROM 1755 TO 1899.

1. Braddock's Defeat, 1755. Washington Leading the Virginia Troops against the Indians. English Regulars on Left in Red Coats. Virginia Troops on Right in Blue.
2. Gen. Wolfe Climbing Heights of Abraham.
3. Death of Gen. Wolfe, 1759. Battlefield.
4. Death of Gen. Montcalm, 1759. Battlefield.
5. Wolfe and Montcalm Monument. Quebec.
6. Patrick Henry Addressing the Virginia Legislature, 1765.
7. The Spirit of '76. Interior of a Colonial Home. Young Man Being Equipped for Battle.
8. Boston Massacre, 1770. British Regulars Firing on Citizens.
9. Boston Tea Party, 1773. Men Disguised as Indians Throwing Tea Overboard. Moonlight.
10. Scene of Boston Tea Party. Long Wharf, Boston, Mass.
11. Battle of Lexington, 1775. Major Pitcairn Gives Order to Fire. Several Americans Fall Wounded.
12. Battle Monument, Lexington, Mass.

13. Struggle on Concord Bridge, 1775. Continental Troops Driving British Before Them.

14. Retreat of British From Concord, 1775. Village in Distance.

15. Capture of Fort Ticonderoga, 1775. Ethan Allen Demanding Commander to Surrender.

16. Ruins of Fort Ticonderoga.

17. Battle of Bunker Hill, 1775. Death of General Warren.

18. Sergeant Jasper Saving Flag at Defense of Fort Moultrie.

19. Washington with Picked Men Crossing the Delaware to Trenton, 1776. Winter. Ice in River. From Picture in Metropolitan Museum, N. Y.

20. Declaration of Independence, 1776. Committee of Five Led by Jefferson and Franklin Presenting Document to John Adams, the Chairman.

21. Independence Hall, Philadelphia. Interior. Room Where Declaration Was Signed.

22. Settlement of Western States. Daniel Boone Rescuing His Daughter From Indians, 1776.

23. Surrender of Burgoyne, 1777. Burgoyne Handing Sword to General Gates.

24. Action of "Serapis" and "Bon Homme Richard," 1778. Night Vessels on Fire. The "Alliance" Treacherously Fires on the "Richard."

25. Treason of Arnold. Andre and Arnold Conferring.

26. Capture of Major Andre, 1780. Papers Found in His Boots. Three Americans.

27. Scene of Andre's Capture. Monument near Tarrytown, N. Y.

28. Surrender of Cornwallis, 1781. General O'Hara, Sent by Cornwallis, Is Delivering Sword to General Lincoln, Who Represents Washington.

29. Franklin at the French Court. Brilliant Costumes of Ladies and Courtiers. Plainness of Franklin's Attire.

30. Battle of New Orleans. General Jackson Directing His Men Behind the Intrenchments.

31. Defense of the Alamo. Colonel Bowie on Cot in Doorway. David Crockett Brandishing Knife in Foreground. Mexicans in High-Peaked Hats.

32. The Alamo, San Antonio, Tex.

33. Henry Clay Addressing the United States Senate.

34. Combat Between the Monitor and the Merrimac. The Latter is Sheathed with Iron Rails. Confederate Flag at Her Bow. Monitor Flies the Federal Flag. Revolving Turret.

35. Birds-eye View of Bombardment of the Forts of Santiago. Spanish Fleet Inside.

36. Entrance to Santiago Harbor. Morro Castle, Cuba.

37. Defence of Fort Moultrie.

38. Washington Crossing the Delaware.

39. Surrender of Cornwallis—1781.

40. Inauguration of Washington.

41. Star Spangled Banner.

42. Star Spangled Banner.

43. First R. R. Train, N. Y. State. 1830.

44. First Steamboat—1807

LESSON 1701.

LIFE OF WASHINGTON.

1. Portrait of Washington by Stuart.

2. The Cherry Tree Incident.

3. Young Washington as a Peacemaker.

4. People of Winchester Appealing to Washington.

5. Washington as a Surveyor. Setting up His Instruments. Assistants. Forest.

6. Washington at Fort Du Quesne. Salutes British Flag. English Troops. Highlander.

7. Courtship of Washington. Mrs. Custis and Her Children.

8. Marriage of Washington.

9. Washington on His Way to the First Congress.

10. Washington Taking Command of the Army. Pine Tree Flag and Bunker Hill Flag Carried by Troops.

11. Washington's Prayer at Valley Forge. Officers Around Fire in Distance. Snow on Ground. 1777.

12. Washington and Congress at Valley Forge.

13. Washington's Headquarters. Valley Forge, Pa. Exterior.

14. Washington as Commander-in-

Chief of Continental Army. General's Costume. White Horse.

15. Bringing the News of the Surrender of Cornwallis. Night. People Aroused by Messenger. All Classes Represented. 1781.

16. Washington Entering New York at Head of His Army.

17. Washington and His Generals.

18. Washington Taking Leave of His Generals at New York. Washington in Boat Waves His Hat to Generals on Pier.

19. The Inauguration of Washington, New York City.

20. Washington's Last Interview with His Mother.

21. Washington's Mansion From the Gate, Mt. Vernon, Va.

22. Rear of Mansion, Mt. Vernon, Va.

23. Old Pohick Church, Mt. Vernon, Va., Where Washington Worshipped.

24. Lafayette at Mt. Vernon, 1782. View on Veranda. The Potomac in the Distance.

25. Lady Washington's Reception. Brilliant Costumes. Powdered Hair.

26. Last Moments of Washington. Small Upper Room at Mt. Vernon.

27. Tomb of Washington. The Sarcophagus, Mt. Washington, Va.

28. Portraits of George and Martha Washington.

LESSON 1702.

PORTRAITS OF MEN FAMOUS IN CONNECTION WITH AMERICAN HISTORY.

1. Cnristopher Columbus.
2. Washington.
3. Benjamin Franklin.
4. Patrick Henry.
5. Thomas Jefferson.
6. Alexander Hamilton.
7. William Pitt.
8. Lafayette.
9. Paul Revere.
10. Daniel Webster.
11. Gen. Stonewall Jackson.
12. James A. Garfield.
13. Wm. McKinley.
14. Theodore Roosevelt.

LESSON 1703.

PORTRAITS OF VARIOUS EDUCATORS, AUTHORS AND INVENTORS.

1. Wm. T. Harris.
2. F. L. Soldan.
3. H. W. Longfellow.
4. R. W. Emerson.
5. Alfred Tennyson.
6. Robert Burns.
7. W. C. Bryant.
8. Thomas Edison.
9. Alex. Graham Bell.

LESSON 1704.

LIFE OF ABRAHAM LINCOLN.

1. Birthplace of Lincoln.
2. Lincoln on a Flat Boat.
3. Lincoln a Woodchopper, Studying at Noon.
4. Lincoln's Debate with Douglas.
5. Lincoln Raising the Flag at Independence Hall.
6. Lincoln's First Inauguration.
7. Lincoln Visiting Soldiers in Hospital.
8. Lincoln Reading of Emancipation Proclamation.
9. Lincoln's Speech at Gettysburg.
10. Lincoln's Visit to Richmond.
11. Assassination of Lincoln.
12. Death-bed of Lincoln.
13. Portrait of Lincoln.

LESSON 1705.

LIFE OF GEN. U. S. GRANT

1. Birthplace of U. S. Grant.
2. Lieut. Grant Aiming a Cannon. Battle of Chapultapec.
3. Capture of Ft. Donaldson.
4. Maj. Gen. Grant's charge at Battle of Shiloh.
5. Siege of Vicksburg, Miss.
6. Grant's Triumphal entry into Vicksburg.
7. Capture of Petersburg, Va.
8. Surrender of Lee.
9. Taking the Oath, Second Inauguration of Grant.
10. Cottage, Mt. McGregor, N. Y.
11. Death-bed of U. S. Grant.
12. Allegory—Let Us Have Peace.
13. Portrait of U. S. Grant.

LESSON 1706.

PORTRAITS OF MEN—FAMOUS IN CONNECTION WITH HISTORY OF EUROPE.

1. Oliver Cromwell.
2. Frederick the Great.
3. Napoleon Bonaparte.
4. Bismarck.
5. Emperor William II.
6. Czar of Russia.
7. Edward VII.

LESSON 1707.

HISTORIC STYLE OF ARCHITECTURE. No. 1.

Egyptian, Greek and Roman.

(a) Egyptian.

1. Pyramid of Chephren, near Cairo. Smooth Casing Preserved on Upper Portion.
2. Rock Cut Tombs at Beni Hassan. Proto-Doric Columns at Entrance.
3. Mummy Case Covers. Highly Decorated. Gizeh Museum, Cairo.
4. The Temple of Fdfu. Best Preserved Egyptian Temple. Exterior. Front and One Side. Pylon. Open Court with Colonnade.
5. Ruins of Temple at Kalabsheh Flat Roof. Massive Outer Wall Unbroken by Doors or Windows. Barren Sandy Waste Stretches Off in the Distance.
6. Colonnade in the Great Hall of Columns at Karnak. Columns Resemble Bundles of Reeds Tied Together. (Origin of Columns). Massive Blocks of Stone in Architrave.
7. Architrave, Capitals and Portions of the Shafts of Colonnade of Temple at Esneh. Remainder of Shafts Buried in the Sand. Capitals Shaped Like the Open Lotus Flower, with Palm Leaf Ornamentation in Relief.
8. Unfinished Obelisk in Quarry at Assuan. Shows How Obelisks Were Cut Out of the Solid Rock in One Piece.
9. Colossal Portrait Statue of Amenople III, near Thebes (the "Vocal Memnon" of the Greeks).

(b) Greek.

10. Lions' Gate. Mycenae. Massive Masonry (cyclopean) Rude Forms of Lions over Gateway. Pre-historic Greek Art.
11. Ruins of Ancient Doric Temple at Corinth. (Compared with Proto-Doric Columns at Beni Hassan). High Rocky Hill in Background.
12. The Parthenon. West Front. Illustrates Constructive Members of Greek Temple, viz: Pediment, Entablature, Colonnade and Stylobate, and Their Sub-divisions. Doric Order. Finest Example.
13. West Frieze of Parthenon in Place.
14. Temple of Theseus. Athens. Best Preserved Greek Temple. Doric Order.
15. Sculpture Decoration in Corners of Greek Pediment. Archaic Period. Shows How They Adapted Figures to Suit the Space.
16. The Erectheum. Acropolis, Athens. West Front With Portico of the Caryatides on South Side. Ionic Order.
17. Temple of Nike (Victory), Acro-

polis, Athens. Ionic Order. Decorated Frieze.

18. Choragic Monument of Lysicrates, Athens. Corinthian Order. Modern Greek Buildings in Background.

(c) Roman.

19. Square House at Nimes, France. Corinthian Order. Shows How the Romans Made Use of the Greek Temple Style.

20. The Pantheon. Rome. Round, Domed Building With Greek Portico. Latter Has Corinthian Columns. Egyptian Obelisk in Foreground.

21. The Coliseum, Rome. Exterior. A Typical Roman Amphitheater. Exterior Decorated with Doric Ionic and Corinthian Pilasters. Meta Sudas or Gladiators', Fountain in Foreground.

22. Arch of Titus, Rome. A Roman Triumphal Arch of the Best Period. Corinthian Columns. Reliefs on Interior of Arch.

23. Arch of Constantine, Rome. Corinthian Columns. Difference in Merit of Sculptured Decoration; the Best Taken from Destroyed Arch of Trajan. Coliseum on Right in Background.

24. Arch of Triumph, Paris. Erected by Napoleon I in Imitation of Roman Emperors.

25. Forum of Trajan, Rome. Columns of Ruined Basilica in Foreground. Triumphal Column in Trajan with Spiral Ornamental Band. Modern Church and Buildings in Background.

26. Basilica of Constantine, Rome. Great Arches. Middle One Ends in Apse.

LESSON 1708.

HISTORIC STYLES OF ARCHITECTURE. No. 2.

Early Christian, Mediaeval and Modern.

(a) Early Christian.

1. Church of San Apollinare. Nuovo Ravenna. Exterior. Vestibule, Campanile or Bell Tower. Elevation of Nave. Plain Exterior, Developed from Roman Basilica.

2. Church of San Clemente, Rome. Exterior. A Modified Early Christian Basilica. General Plan is Ancient. Details Comparatively Modern.

3. San Clemente, Rome. Interior. Pulpits and Choir Railing Date from Fourth Century. Mosaics in Apse. Columns and Ceiling are Modern.

(b) Mediaeval.

4. Byzantine Style. Church of St Sophia. Constantinople. Great Dome and Half Domes. Plain Exterior. Minarets Added by Mohammedans.

5. Byzantine Style. Church of St. Sophia. Interior. Great Central Space Covered by Dome and Half Domes. Mosaics Concealed by Whitewash. Arabic Mottoes from Koran Substituted. Beautiful Columns.

6. Mohammedan Style. Mosque of Mahomei Ali, Cairo, Egypt. Exterior. Developed from Byzantine. (Compared with St. Sophia).

7. Mohammedan Style. Mosque of Sultan Hassan, Cairo, Egypt. Interior. Beautiful Arabesques on Wall. Moorish Arches in Windows.

8. Italian Byzantine Style. St. Mark's Church, Venice. Facade, Greek Cross Ground Plan. Domes. Colonnade. Mosaics. Gothic Pinnacles Added Later, Gorgeous Color.

9. Romanesque Style. Cathedral of Speyer, Germany. Exterior. Square Towers. Round Arches. Small Windows. Apse. Double Transept. Simple and Dignified Effect.

10. Romanesque Style. Cathedral of Speyer. Interior. Round Arched Ceiling. Simple Cross Vaulting. Massive Piers Ornamented with Simple Engaged Columns.

11. Romanesque Style. (Norman). Cathedral of Durham, England. Massive Square Towers. Battlements. Round Arches.

12. Romanesque Style. (Norman). Cathedral of Durham. Interior. Round Arches. Simple Cross Vaulting. Massive Round Columns Alternating with Piers. Zig-zag Ornamentation. Choir Screen. Rose Windows.

13. Gothic Style. (French). Cathedral of Chartres. Exterior. Pointed Arches. Buttresses. Rose Window. Spires. (The Plainer One is Earlier). Transept.

14. Gothic Style. (French). Cathedral of Amiens. Exterior. Best Period of Style. Beautifully Decorated. ("Bible

in Stone." Same Features as in Cathedral of Chartres. Spires Unfinished. Slender Spire at Intersection of Nave and Transept.

15. Gothic Style. (French). Cathedral of Amiens. Interior. Pointed Arches. Vaulted Roof. Clustered Columns. Polygonal Apse Filled with Stained Glass. Triforium. Lofty Nave.

16. Gothic Style. (French). Cathedral of Rheims. Exterior. (Finest Gothic Facade in the World). Beautifully Proportioned. Sculpture Decoration. Towers not Crowned with Spires. (Unfinished).

17. Gothic Style. (French). Cloister of St. Michael. Double Row of Gothic Arches and Columns. Delicate Proportions.

18. Gothic Style. Cathedral of Cologne, Germany. (French Model). Exterior from N. E. Completely Developed Example of Style. Apse. Transept, Spires, Buttresses, etc.

19. Gothic Style. Cathedral of Cologne. Interior Looking Toward Apse. Same Features as in Amiens Cathedral.

20. Gothic Style. Portal of the Cathedral of Freiburg. Pointed Arch. Sculptured Figures.

21. Gothic Style. (English). Lincoln Cathedral. Exterior. Square Towers. Massive Square Tower at Intersection of Nave with Transept. Lack of Buttresses. Length Compared to Height.

22. Gothic Style. (English). Cathedral of York. Interior. Fan Vaulting. Apse Ends in a Vertical Wall Filled by One Large Stained Glass Window. Choir Stalls of Carved Wood.

23. Gothic Style. (Italian). Cathedral of Milan. Exterior. Not Pure Gothic. Absence of Spires and Towers. Dome-like Structure over Intersection of Transept and Nave. Renaissance Details in Facade. Wealth of Sculptured Ornamentation.

24. Gothic Style. (Italian). Doges' Palace, Venice. Gothic Only in its Details and Ornamentation, not in its Construction. Pointed Arches. Geometric Tracery. Unbuttressed.

25. Moorish Style. Court and Fountain of Lions, Alhambra, Spain. Delicate Arabesques on Walls. Double Columns. Lightness of Effect. Rude Forms of Lions. Influence of Religion.

(c) Modern.

26. Renaissance Style. Pitti Palace Florence, Italy. Exterior. Roman Influence Shown in Massive Masonry and Round Arches. Also in the Use of Pediments Over Windows. Effect of Simplicity and Strength.

27. Renaissance Style. St. Peter's Church, Rome. Facade. Great Dome. Differs from Roman Domes in Being Mounted on Drum and Surmounted by Lantern. Facade Not Satisfactory Artistically. Use of Classic Columns and Pediment. Egyptian Obelisk in Foreground.

28. Renaissance Style. Grand Opera House, Paris. Exterior. Classic Details. Columns, Curved Pediments. Round Arches.

29. Renaissance Style. City Hall, Boston. Classic Columns and Pilasters. Use of Different Orders in Different Stories. Round Arches Dome. (Compare with St. Louis Post Office).

30. Renaissance Style. Private Residence, Salt Lake City. Exterior. Classic Columns. Pediments over Windows.

31. Renaissance Style. Dining Hall of a Modern Hotel. Classic Columns and Pilasters. Pediments Over Doors. Round Arches in Windows. Characteristic Relief Decorations on Walls and Ceiling.

LESSON 1709.

GREAT ARTISTS AND THEIR WORKS.

1. Nicolo Pisano. Pulpit in Cathedral of Sienna.

2. Michael Angelo in His Studio. Statues of Moses, Two Slaves and the Pieta.

3. Michael Angelo. Statue of Moses. Tomb of Julius II. Church of St. Peter in Vincoli, Rome.

4. Exterior of Convent Containing Leonardo Da Vinci's "Last Supper." Milan.

5. Leonardo Da Vinci. "The Last Supper."

6. Leonardo Da Vinci. "Mona Lisa." Louvre, Paris.

7. Raphael Painting Portrait of Princess of Arragon.

8. Raphael. "La Belle Jardiniere." Louvre, Paris.

9. Raphael. "Madonna of the Chair," Pitti Gallery, Florence.

10. Raphael. "The Parnassus." Vatican, Rome.
11. Raphael. "The Transfiguration." (Upper Part). His Last Work. Vatican. Rome.
12. Raphael. Sistine Madonna. Dresden.
13. A Dinner with Titian Scene. Portico of a House in Venice.
14. Titian. "Presentation of Virgin at Temple." Academy, Venice.
15. Paul Veronese Receives Visit from Doge of Venice.
16. Guido Reni "Aurora, Apollo and the Hours." Fresco in Rospigliosi Palace, Rome
17. Corregio. "Holy Night." Dresden.
18. Murillo. "Immaculate Conception." Louvre, Paris.
19. Murillo. "Melon Eaters."
20. An Afternoon with Rubens. The Painter and His Family.
21. Rubens. "The Descent From the Cross." Cathedral of Antwerp.
22. Rembrandt. Portrait of Himself.
23. Rembrandt. "The Pilgrims at Emmaus." Louvre, Paris.
24. Philip IV and Velasquez.
25. Valasquez. "Infanta Marguerita Theresa." Louvre, Paris.

LESSON 1710.

GREAT ARTISTS AND THEIR WORKS.

1. Madonna of Grand Duke — Raphael.
2. La Belle Jardiniere—Raphael.
3. Peter and John at Beautiful Gate—Raphael.
4. Head of Christ—Leonardo Da Vinci.
5. The Night Watch—Rembrandt.
6. Syndies of Amsterdam—Rembrandt.
7. Charles 1. (Full length)—Van Dyck.
8. The Four Evangelists — A. Duerer.
9. Duerer's Mother—A. Duerer.
10. Madonna Enthroned — Andrea del Sarto.
11. Assumption of Virgin—Titian.
12. Singing Angels—T. Van Dyck.
13. Raising of Lazarus—Sebastiano del Piombo.
14. Apollo and the Muses — Guilio Romano.
15. Egyptian Feast.
16. Banquet of Officers and Archers of St. Adrian—Franz Halz.
17. Attack at Hochkirch—Menzel.
18. Iron Rolling Mills—Menzel.
19. Hannibal's Grave.—E. Pracht.
20. Lucullus' Bust—C. A. Berman.
21. Jorg Gisse—H. Holbein.
22. Cobbler—Liebermann.
23. Old Woman with Goats—Liebermann.
24. Shepherdess—Liebermann.
25. Orphan Girls—Liebermann.
26. In the Workmen's Quarter — Hoeniger.
27. East Berlin—Hoeniger.
28. At the City Mall, Berlin—Hoeniger.
29. Field Workers—Urg.
30. Animal Study—K. du Jardin.
31. The Reading Club.
32. Hildesheim Dome—Letterer.
33. Wotan Group—Engelhard.
34. Horse Fair—Rosa Bonheur.
35. Calling the Ferryman.

LESSON 1711.

PORTRAITS OF GREAT ARTISTS.

1. Michael Angelo.
2. Raphael.
3. Murillo.
4. Rubens.
5. Rembrandt.

LESSON **1712.**

MILLET AND HIS FRIENDS.

1. Millet. "The Sower."
2. Millet. "Shepherdess Knitting." Flock of Sheep.
3. Millet. "Feeding Her Birds." Mother Giving Food to Her Children.
4. Millet. "Planting Potatoes." Man and Woman in Field.
5. Corot. "Spring." Wood Nymphs Dancing.
6. Corot. "Landscape." Cottage. Willows Overhanging Stream.
7. Corot. "Willows." Women Working in Field.
8. Corot. "Ville D'Avray." Small Lake on Right. Houses. Old Square Tower.
9. Corot. "Landscape." Mass of Old, Bent Trees on Right. City in Distance. Horseman in Foreground.
10. Corot. "Landscape." Trees, Pond, Cottages in Distance.
11. Corot. "Landscape." Stream. Man in Boat. Willows on Bank.
12. Troyon. "Girl Feeding Turkeys."
13. Daubigny. "Landscape." Marshy Pond in Foreground.

LESSON **1713.**

ART.

1. Copy. Guido Reni—Hours.
2. Markart. Catherine Cornare.
3. Pursuit of Fortune.
4. Kaulbach. Age of Reformation.
5. Kaulbach. Battle of the Huns.
6. Kaulbach. Destruction of Jerusalem.
7. Kaulbach. Tower of Babel.
8. Berlin. Homer and the Greeks.
9. Cornelius. Angels and Vial of Wrath, Berlin.
10. Cornelius. God the Father, Resurrection, etc.
11. Cornelius. Satan's Fall, Berlin.
12. Feuerbach. Plato's Banquet.
13. Kuille. Tannhauser and Venus.
14. Ariadne. Vatican.
15. Canova. Venus Victrix.
16. Bongeran. Angels.
17. Venice. Gondolier.
18. Arctic Scene. Polar Night.
19. Arctic Scene. Ice Floes, Men and Dog.
20. Arctic Scene. Vessel Baremasted in Sea.
21. Arctic Scene. Ship in Ice, Listing.
22. Landseer. Deer.
23. "Helping Hand."
24. Schmitzberger. Waiting for Breakfast.

LESSON **1714.**

"CURFEW SHALL NOT RING TO-NIGHT."

Ten Slides Illustrating the Poem.

1. "Slowly England's Sun was setting o'er the hilltops far away."
2. "I've a lover in that prison."
3. "'Bessie,' calmly spoke the sexton."
4. "Bessie made a solemn vow."
5. "She sprang within the old church tower."
6. "She had reached the topmost ladder."
7. "Curfew shall not ring to-night."
8. "Firmly on the dark old ladder."
9. "At his feet she tells her story."
10. "Kneeling on the turf beside him."

LESSON **1715.**

SHERIDAN'S RIDE.

1. "Telling the battle was on once more, and Sheridan twenty miles away."
2. "Hills rose and fell, but his heart was gay, with Sheridan fifteen miles away."
3. "Every nerve of the charger was

strained to full play, with Sheridan only ten miles away."

4. "He is snuffing the smoke of the roaring fray, with Sheridan only five miles away."

5. "I have brought you Sheridan all the way from Winchester down to save the day."

6. "And when their statues are placed on high, under the dome of the Union sky."

LESSON 1716.

THE CHARGE OF THE LIGHT BRIGADE.

1. "Forward the Light Brigade charge for the guns he said."
2. "Stormed at by shot and shell Boldly they rode and well."
3. "Flashed all their sabres bare Sabring the gunners there."
4. "All that was left of them Left of six hundred."

LESSON 1717.

PAUL REVERE'S RIDE.

1. "Then he climbed to the tower of the church,
   Up the wooden stairs with stealthy tread."
2. "And lo! as he looks, on the belfry's height,
   A glimmer, and then a gleam of light!"
3. "And beneath, from the pebbles, in passing, a spark.
   Struck out by a steed, that flies gearless and fleet."
4. "It was twelve by the village clock
   When he crossed the bridge into Medford town."
5. "It was one by the village clock,
   When he gallopped into Lexington."
6. "And one was safe and asleep in his bed.
   Who at the bridge would be first to fall."
7. "How the farmers gave them ball for ball.
   From behind each fence and farmyard wall."

LESSON 1718.

LITERARY SELECTION—THE BRIDGE.

1. "I stood on the Bridge at midnight, as the clocks were striking the Hour."

2. "How, often, O how often, in the days that had gone by."

3. "And only the sorrow of others throws its shadow over me."

4. "I see the long procession still passing to and fro."

5. Portrait of Henry Wadsworth Longfellow.

LESSON 1719.

RIP VAN WINKLE.

1. Rip playing with the Children.
2. Rip at the Village Inn.
3. Rip and his Scolding Wife.
4. Rip on the Mountains.
5. Rip Returns after a Nap of Twenty Years.
6. Rip Relating his Story.

LESSON **1720.**

THE VILLAGE BLACKSMITH.

1. "Under a spreading chestnut tree
   The village smithy stands;"
2. "You can hear him swing his heavy sledge
   With measured beat and slow;"
3. "And children coming home from school
   Look in at the open door;"
4. "He goes on Sunday to the church.
   And sits among the boys."
5. "And with his hard rough hand he wipes
   A tear out of his eyes."
6. "Each morning sees some task begun.
   Each evening sees its close.'

LESSON **1721.**

HIAWATHA.

1. Hiawatha's Wooing.
2. Hiawatha's Wedding.
3. The Death of Minnehaha.
4. Hiawatha's Departure.

LESSON **1722.**

EVANGELINE.

1. The Forest Primeval.
2. Pastor in Street of Acadia.
3. Evangeline Going to Church.
4. House and Barns of Benedict
5. Evangeline and Gabriel Hunting Eggs.
6. Indian Summer — Return of Flocks and Harvesters.
7. Basil and Benedict arranging Betrothal.
8. Notary Drinking to Health of Couple.
9. Merry-making at the Betrothal.
10. Women in Churchyard—Arrival of Soldiers.
11. English Commander Delivering Orders.
12. Priest in Church Subduing his People.
13. Parting of Evangeline and Gabriel.
14. Evangeline with her Father at Seaside.
15. Burial of Evangeline's Father.
16. Evangeline at the Prow of the Boat.
17. Boat on Mississippi.
18. Basil on Horse calling his Cattle.
19. Evangeline in the Garden.
20. Indian Women at Tent of Evangeline.
21. Black-robed Chief of the Missions.
22. Hunter's Lodge in Ruins.
23. Evangeline in Philadelphia visiting the Sick.
24. Evangeline finds Gabriel at Last.

LESSON **1723.**

MERCHANT OF VENICE.

1. Old Gobbo and his Son Launcelot—Act II. Sc. II.
2. Jessica Throwing down a Casket—Act II. Sc. V.
3. Shylock Bewailing the Loss of his Daughter—Act III. Sc. I.
4. Bassanio Choosing the Casket—Act III. Sc. II.
5. Portia Giving Ring to Bassanio —Act III. Sc. II.
6. Bassanio Reading Letter from Antonio—Act III. Sc. II.
7. Portia (as Balthazzar) Speaking in Court—Act IV. Sc. I.
8. Shylock Preparing to Take the Pound of Flesh—Act IV. Sc. I.
9. Shylock Hearing his Sentence of Condemnation—Act IV. Sc. I.
10. Portia Reproaching Bassanio for Parting with Ring—Act V. Sc. V.
11. Portrait of Wm. Shakespeare.

LESSON **1724.**

LADY OF THE LAKE.

1. "He sorrowed o'er the expiring horse."
2. "In listening mood she seemed to stand."
3. "Tis thus our charmed rhymes we sing."
4. "Wake Allan Bane, aloud she cried."
5. "The hounds the hawk her ears divide."
6. "Grant me this maid to wife."
7. "Chieftains, forego!"
8. "The Cross thus formed he held on high!"
9. "Alas! she sobbed—and yet be gone."
10. "The messenger of fear and fate"
11. "With Alpine's Lord the Hermit Monk held solemn word."
12. "Ellen beheld as in a dream"
13. "He placed the golden circlet on."
14. "The fierce avenger is behind!"
15. "By Him whose word is truth!"
16. "Thy name and purpose! Saxon stand!"
17. "These are Clan Alpine's warriors true."
18. "And locked his arms his foeman round."
19. "And ever James was bending low."
20. "Back on your lives, ye menial pack!"
21. "Hear ye, my mates."
22. "Hark, minstrel! I have heard thee play."
23. "No word her choking voice commands."
24. "Then gently drew the glittering band."

LESSON **1725.**

THE BROOK.

1. "I come from haunts of coot and hern."
2. "By thirty hills I hurry down."
3. "Till last by Philip's farm I flow."
4. "I chatter over stony ways."
5. "With many a curve my banks I fret."
6. "I wind about and in and out."
7. "And here and there a foamy flake."
8. "I steal by lawns and grassy plots."
9. "I slip, I slide, I gloom, I glance."
10. "I murmur under moon and stars."

LESSON **1726.**

RED RIDING HOOD.

1. Little Red Riding Hood Leaving Home.
2. Little Red Riding Hood Meeting Wolf.
3. The Wolf at Door of Grandmother's Cottage.
4. The Wolf Dressing in Grandmother's Nightrobe.
5. Little Red Riding Hood in Bed with the Wolf.
6. The Wolf Killed by Woodman.

LESSON **1727.**

CINDERELLA.

1. Cinderella Helping her Sisters dress for the Ball.
2. Cinderella's Sisters Leave her alone at Home.
3. Cinderella's Godmother Appears.
4. Cinderella at the Ball.
5. Cinderella Drops the Glass Slipper in her Flight.
6. The Glass Slipper Fits Cinderella's Foot.

LESSON **1728.**

THE PIED PIPER.

1. "Rats? They fought the dogs, and killed the cats,
   And bit the babies in their cradles."
2. "Rouse up, Sirs! Give your brains a racking.
   To find the remedy we're lacking."
3. "His queer long coat from heel to head,
   Was half of yellow, half of red."
4. "And out of the houses the rats came tumbling,
   Great rats, small rats, lean rats, brawny rats."
5. "Until they came to the River Weser,
   Wherein all plunged and perished."
6. "And folks, who find me in a passion,
   May find I can pipe to another fashion."
7. "Tripping and skipping ran merrily after,
   The wonderful music with shouting and laughter."
8. "And lo! As they reached the mountain side.
   A wondrous portal opened wide."

LESSON **1729.**

SNOW WHITE.

Twelve Colored Slides.

LESSON **1730.**

THE UGLY DUCKLING.

Fourteen Colored Slides.

LESSON **1731.**

Chicken Little.

1. An Acorn Falls on Chicken Little's Head.
2. Chicken Little Meets Henny Penny.
3. They Meet Cocky Locky.
4. They Meet Ducky Lucky.
5. They Meet Goosey Loosey.
6. They Meet Turkey Lurkey.
7. They Meet Foxy Loxy.
8. Foxy Loxy Leads Chicken Little and Her Friends to His Cave.

LESSON **1732.**

Jack the Giant Killer.

1. Jack.
2. Jack Watching His Flocks.
3. Jack Sees the Giant Stealing His Sheep.
4. The Giant Falls into the Pit.
5. The People Cheer Jack and Proclaim Him Jack the Giant Killer.
6. Jack Falls Asleep near Castle of Giant Blunderboro.
7. Jack is Imprisoned by the Giants.
8. Jack before the Castle of the Two-Headed Giant.
9. Jack Eats Breakfast with the Two Headed Giant.
10. Jack Meets the Prince.
11. Jack Locks the Giant in the Cave.
12. Jack Frees the Princess from the Magician.
13. Jack Kills another Giant.
14. Jack Kills the Giant's Brother.
15. Jack Rescues the Twenty Beautiful Girls.
16. Jack Dines with Prince and Princess.
17. The Giant Chases Jack into the Castle.
18. Jack Rescues the Princess.

LESSON **1733.**

Puss in Boots.

1. Puss and His Master.
2. Puss Traps a Rabbit.
3. Jack Presents a Rabbit to the King.
4. Puss Calls for Help for His Master.
5. Puss Instructs the Mowers.
6. The Giant Transforms Himself into a Lion.
7. The Giant Transforms Himself into a Mouse.
8. The Marquis Weds the Princess.

LESSON **1734.**

Tom Thumb.

1. The Plowman Consults the Magician.
2. Tom Thumb is Born.
3. Tom Thumb's Christening.
4. The Tailors Fit Tom's Clothes.
5. Tom Falls into the Pudding.
6. Tom's Mother Gives the Pudding to the Tinker.
7. The Frightened Tinker Throws the Pudding Away.
8. Tom Returns to His Mother.
9. Tom is Swallowed by a Cow.
10. Tom's Adventure with the Fish.
11. Tom Is Presented to the Queen.

LESSON **1735.**

The Three Pigs.

1. The Mother Pig Has No Food for Her Children.
2. The Three Little Pigs Go Out to Seek Their Fortune.
3. The First Pig Builds a Straw House.
4. The Second Pig Builds a Wooden House.
5. The Third Pig Builds a Brick House.
6. The Wolf Calls at the Straw House.
7. The Wolf Calls at the Wooden House.
8. The Wolf Calls at the Brick House.
9. The Wolf Goes to the Woods to Make Plans.
10. The Wolf Finds the Pig in a Tree.
11. The Pig Outwits the Wolf.
12. The Pig Goes to the Circus.
13. The Pig Comes Home in the Barrel.
14. The Pig Builds a Fire in the Fireplace.
15. The Wolf Comes Down the Chimney.
16. The Wolf is Served for Dinner.

LESSON **1736.**

The Three Bears.

1. The Three Bears at Home.
2. The Baby Bear Shoots at a Bird.
3. The Bear's Aim Is Bad.
4. The Mother Bear Prepares the Porridge.
5. The Three Bears Prepare for a Walk.
6. The Baby Bear Enjoys the Walk.
7. Goldenlocks Peeps Through the Keyhole.
8. Goldenlocks Tastes the Porridge.
9. Goldenlocks Breaks the Baby Bear's Chair.
10. Goldenlocks Falls Asleep.
11. Father Bear, "Somebody has been at my Porridge."
12. Baby Bear, "Somebody has been at my porridge and has eaten it all up."
13. Father Bear, "Somebody has been sitting in my chair."
14. Baby Bear, "Somebody has been sitting in my chair and has sat the bottom out of it."
15. Mother Bear Shares Her Porridge with Baby Bear.

16. Father Bear, "Who has been lying in my bed?"
17. Mother Bear, "Who has been lying in my bed?"
18. Baby Bear, "Who has been lying on my bed, and here she is."
19. Goldenlocks Awakens.
20. Goldenlocks Jumps out of the Window and Runs Home.

LESSON **1737.**

Robinson Crusoe.

1. The Wreck of the Ship.
2. Robinson on the Raft.
3. Robinson Setting up His Calendar.
4. Crusoe Making Baskets.
5. The Goat Following Crusoe.
6. Crusoe Teaching the Parrot to Talk.
7. Crusoe Making His House Secure from Attack.
8. Crusoe Building a Boat.
9. Crusoe Rescues Friday.
10. Crusoe Rescues a Spaniard.
11. Crusoe Rescued from the Island.

FOR HIGH SCHOOL WORK. SLIDES ILLUSTRATIVE OF THE CLASSICS.

LESSON **1738.**

SCENES IN NORTHERN AND CENTRAL GREECE.

1. Vale of Tempe.
2. Vale of Tempe.
3. Vale of Tempe.
4. Vale of Tempe.
5. Town of Kastraki, Thessaly.
6. Town of Kalabaka, Thessaly.
7. Rosane, Thessaly.
8. Mount Parnassus.
9. Plain of Krissa, looking toward Delphi.
10. Plain of Krissa from Delphi.
11. Delphi from South, Cliff only.
12. Delphi, Castalian Spring.
13. Thespiae, General View.
14. Site of Platea and Mt. Cithaeron.
15. Ruins of Fortifications at Elentheral.
16. Eleusis, Ruins of Temple Demeter.
17. Eleusis, The Greater Propylea.
18. Eleusis, Temple of Artemis.
19. Eleusis, Lesser Propylea.
20. Marathon, Looking toward the Sea.
21. Marathon, The Mound.
22. Modern Athens and Mt. Lycabettus.

LESSON **1739.**

SCENES IN THE PELOPONNESUS.

1. Olympia, General View.
2. Olympia.
3. Olympia, Temple of Zeus.
4. Modern Museum at Olympia.
5. The Alpheus River, Olympia.
6. Mt. Ithome.
7. Temple of Apollo at Phigalia (Bassae).
8. Messene Walls, West of Arcadian Gate.
9. Nearer View of Arcadian Gate.
10. Summits of Taygetus.
11. Langada Pass, Showing Wall.
12. Langada Pass.
13. Gorge at Daphnon from Lada.
14. Trypsi, Entrance of Langada Pass.
15. View of the Eurotas above Sparta.
16. Sparta and Taygetus Mountains.
17. Plain of Mautinea.
18. Tiryns, Gate into Acropolis.
19. Tiryns, Part of Wall.
20. Gallery in Wall, Tiryns.
21. Mycenae, General View of the Acropolis.
22. Mycenae, Nearer View, Walls of Acropolis.
23. Mycenae, Grave Circle, Looking toward Lion Gate.

24. Stadium at Epidaurus.
25. Epidaurus, Theatre.
26. Epidaurus, Mine of Tholos.
27. Citadel of Argos.
28. Acro, Corinth.
29. Old Louis Temple, Corinth.
30. Canal through Isthmus of Corinth.
31. General View of Arcadian Gate and Walls.

LESSON 1740.

SLIDES ILLUSTRATIVE OF VERGILIAN SCENES.

1. Ruins of Troy.
2. Figani on Site of Ancient Samos.
3. Figani, Nearer View.
4. Samos, Bay on South Side.
5. Heraeum of Samos.
6. Prehistoric Palace at Phaistos.
7. Thera, General View of Harbor.
8. Thera, Nearer View.
9. Thera, From the Sea.
10. Thera, View of the Coast.
11. Ruins of Ancient City of Thera.
12. Gorge by Sea at Melos.
13. Ruins of old City of Melos.
14. Excavation at Knossos, fine Masonry and Jars.
15. Throne Room, Palace at Knossos.
16. Ruins of Palace, Knossos.
17. Famous Law Code, Inscription at Gortym Crete.
18. Island of Corfu.
19. Fort and Harbor, Corfu.
20. Temple of "Diana" at Syracuse.
21. Temple of Concord at Girgenti, Sicily.
22. Stones of the Cyclops, Sicily.

LESSON 1741.

ILLUSTRATING VIRGIL'S AENEID.

1. Portrait of Virgil.
2. Map of the Wanderings of Aeneid.
3. General View of the Ruins of Troy.
4. Near View of the Ruins of the Acropolis of Troy.
5. Section of one of the Oldest Walls of Troy.
6. Ulysses returns Chryseis to her Father. (Painting by Gelee).
7. Lacoon and the Wooden Horse. (Drawing).
8. Sack of Troy. (From Vase in Louvre).
9. Venus and Anchises. (Painting by Sir William Blake Richmond).
10. Aeneas and Anchises. (Painting by Spada).
11. Aeneas bearing Anchises from Troy. (Drawing).
12. Flight of Aeneas. (Painting by Signorelli Luca).
13. Aeneas invoking the Gods. (Drawing).
14. General View of Mt. Aetna.
15. Polyphemus approaching the Ships. (Drawing).
16. Ulysses deriding Polyphemus. (Painting by Turner).
17. Island of Ortygia, View from Villa Politi.
18. Eryx, Bastion, near Site of Temple of Venus.
19. General View of the Site of Carthage.
20. Carthaginian Walls.
21. Dido building Carthage. (Painting by Turner).
22. Dido directing the Equipment of the Fleet. (Painting by Turner).
23. Dido receiving Bad News from Troy. (Painting by Guerin).
24. Decline of Carthage. (Engraving from painting by Turner).
25. Ruins of Carthage. (Painting by Ghiselfi).
26. Dido and Aeneas. (Engraving from painting by Turner).
27. Death of Dido. (Drawing).
28. Death of Dido. (Painting by Liberale).
29. The Regatta and the mishap of Menoetes. (Drawing).
30. Segesta—View of theater looking down Valley.
31. Segesta—View down the Valley showing the Temple.
32. General View of Naples, Bay and Vesuvius in the Distance.

33. Aeneas and the Sibyl in the Jaws of Orcus. (Drawing).
34. Venus giving Aeneas his arms and shield. (Drawing).
35. Siege of Laurentum. (Drawing).
36. Death of Pallas. (Drawing.)
37. Arrival of Camilla the Amazon (Drawing).
38. Death of Camilla. (Drawing).
39. Combat between Turnus and Aeneas. (Drawing).

LESSON 1742.

SLIDES SHOWING ROMAN AND POMPEIIAN SCENES.

1. General View Pompeii.
2. Street in Pompeii.
3. Interior of Shop, Pompeii.
4. Fountain, Pompeii.
5. Oven and Mill, Pompeii.
6. Sacrifice of Iphigenia.
7. Animals, Wall Decoration.
8. Decorative Wall Painting.
9. Mosaic, Cave Canem, Pompeii.
10. House of Pausa, Pompeii.
11. House of Tragic Poet (restored) Pompeii.
12. House of Tragic Poet (actual state) Pompeii.
13. Forum at Pompeii.
14. Roman Forum (restored) N. and E. sides.
15. Roman Forum (restored) S. and W. sides.
16. Roman Forum (restored).
17. Ancient Aqueduct, Campagna.
18. Claudian Aqueduct, Campagna.
19. Roman Aqueduct, Merida, Spain.
20. Tomb of Hadrian, looking North.
21. Ruins of Tombs on Appian Way.

INDEX

Amphibians 51
Animals, Preparations showing Nervous System and Blood Circulation..... 70
Animals, Pictorial Illustrations of 70
Architecture, Types of 81
Astronomical Charts 80

Birds, Domestic, Mounted 28
Birds, Foreign, Mounted 37
Birds, Pictorial Illustration of 36
Botanical Charts 25
Butterflies, Domestic 46
Butterflies, Foreign 48

Camphor 22
Carborundum 77
Clothing Materials 13
Cocoanut 8
Corals 61
Cork 21
Crinoids 60
Crustaceans 54

Dyeing, Materials for 89

Echinoderms 59

Fibers 14
Fishes 63
Fishes, Pictorial Illustrations of 66
Food Products 5
Fossel Formations 78

Geography, Pictorial Illustrations of 82
Glass, Manufacture of 89
Gums 21
Gutta Percha 21

Hide and Leather 89
Historical Charts 81
History, Illustrations of Ancient History 81
Homes, Typical, Illustrations of 85
Hydroids 61
Ink, Manufacture of 88

Insects 43
Insects, Pictorial Illustrations of 45

Japan, Collections Illustrating Life in 87
Japan, Pictorial Illustrations of 83

Language Lessons, Illustrations of 80
Lantern Slides 104

Leather 89
Mammals, Mounted 68
Materials for Clothing 13
Materials used for Tanning 89
Medicinal Plants 20
Mexico, Collections Illustrating Life in 87
Mexico, Pictorial Illustrations of 82

Minerals 72
Mollusks 55
Moths, Domestic 47
Moths, Foreign 48

Needle, Manufacture of 89
North American Indians, Collections Illustrating Life of 87
Nuts, Edible 10
Nuts, Used for Ornaments 11

Oils 11

Paper, Made of Wood Pulp 22
Pen, Manufacture of 88
Pencil, Manufacture of 89
Philippine Islands, Collections Illustrating Life in 88
Philippine Islands, Pictorial Illustrations of 83
Physical Geography, Apparatus for Teaching of 98
Physical Geography, Stereoscopic Views and Charts Illustrating 84
Physics, Apparatus for Teaching of 91
Physiology, Charts Illustrating 80
Plants, Models of 20
Plants, Pictorial Illustrations of 25

Reptiles 50
Peptiles, Pictorial Illustrations of 51

Resins 21
Rubber 21

Shoes, Manufacture of 89
Spices 9
Sponges 62

Tanning, Materials for 89
Tellurian 101
Transportation, Illustrations of 88
Tree Moss 22
Tree Products 21

Waxes 11
Woods, Domestic 18
Woods, Foreign 22
Worms 51

Pamphlet to be inserted into the 1911 Educational Museum Catalogue, following page 172.

LANTERN LESSONS.

LESSON **1610-a.**

HISTORY OF ST. LOUIS.

1. Ferdinand DeSoto.
2. Cordelle Boat of Laclede.
3. Westward Movements, the way St. Louis grew.
4. Map of St. Louis—1820.
5. Map of St. Louis—1903.
6. Map of St. Louis County.
7. Roy's Tower—Foot of Morgan Street.
8. St. Louis as a Trading Post.
9. Trading Post on the Missouri.
10. Fort St. Charles—Principal Spanish Fortification.
11. Fort St. Charles (Better of the Same).
12. Fur Boats.
13. Fur Houses—then and now.
14. First Market.
15. Second Market.
16. Types of Early Houses.
17. Green Tavern.
18. Old Vauxhall Garden.
19. Chouteau Mill.
20. Scene on the Mississippi River.
21. Early Settler's Home—3rd and Plum Sts.
22. First Government House of Upper Louisiana.
23. First Post Office in St. Louis.
24. Chouteau Pond —Present Site of Union Station.
25. First Catholic Church.
26. Second Catholic Church.
27. Walnut St. Cathedral.
28. Old Bent Homestead.
29. Pierre Chouteau's House.
30. Map of the U. S. and Louisiana Purchase.
31. Map of Louisiana Purchase and Statistics.
32. Thomas Jefferson.
33. Napoleon Bonaparte.
34. James Monroe.
35. Ferry in 1832.
36. Fourth St. in 1840.
37. River Front in 1840.
38. Fire Engine in 1835.
39. Avenue through Wilderness.
40. Old French Quarter.
41. Panorama of St. Louis.
42. Workhouse Quarry.
43. Interior of a Shoe Factory.
44. Eads Bridge and Levee.
45. Present River Front.
46. Present River Front.
47. Present River Front.
48. Present River Front.

LESSON **1614-a.**

HYGIENE DEPARTMENT—ST. LOUIS PUBLIC SCHOOLS.

1. Board of Education Laboratory.
2. Office in a School.
3. Testing Vision.
4. Testing Hearing.
5. Testing Heart.
6. Examining Chest.
7. Examining Throat.
8. Examination for Trachoma.
9. Examination of Colored Children.
10. Emergency at School.
11. Defective Eyes.
12. Adenoid Cases.
13. Care of Teeth—Kindergarten Children.
14. Care of Teeth—Larger Children.
15. Consulting Parent.
16. Nurse and Children going to Clinic.
17. Children at Dental Clinic.
18. Children with Glasses.
19. Crippled Boy before Treatment.
20. Crippled Boy after Treatment.
21. Girls' Bathroom.
22. Boys' Bathroom.
23. Inspecting Sanitation.
24. Room ready for Fumigation.
25. Vacuum Cleaning.

LESSON 1619-a.

PANAMA.

1. Map of Canal Zone.
2. Natural Jungle Growth.
3. Culebra Cut as left by French in 1905.
4. Excavating for Canal 1906.
5. Fort Lorenzo at Mouth of Chagres River.
6. Up the Chagres R. from Fort Lorenzo.
7. Plan of Gatun Dam.
8. Concrete Mixer at Gatun.
9. Canal Towers at Gatun Locks—1909.
10. Culebra Cut at Gold Hill. —1909.
11. Culebra Cut at Empire—1909.
12. Field Hospital.
13. Native Kitchen.
14. Porto Bello. Fort and Village.
15. Porto Bello. Machine Shops. Bin for Crushed Rock.
16. Colon. Swamp at Edge of.
17. Colon. Post Office and Gov. Building.
18. Cristobal. Statue of Columbus.
19. Cristobal. Roosevelt Ave.
20. Empire. American Village.
21. Panama City. North Bay at Low Tide.
22. Panama City. North Bay Shore Market.
23. Panama City. South Bay from Old Administration Building.
24. Panama City. Cathedral and Park.
25. Panama City. From Tivoli Hotel.
26. Ancon Hospital and Grounds.
27. Old Panama. Fort near Bridge.
28. Old Panama. Remains of Sea Wall.
29. Old Panama. Bridge built in 16th Century.
30. Old Panama. Tower of Cathedral—1572.

LESSON 1619-b.

FRUITS, PRODUCTS, INDUSTRIES OF PANAMA AND SOUTH AMERICA.

1. Upland Rice Fields.
2. Bread Fruit.
3. Sugar Cane.
4. Primitive Sugar Moulds.
5. Sugar Mill.
6. Coffee Tree and Berries.
7. Drying Coffee Berries.
8. Cacao Tree and Pods.
9. Chocolate Pod and Beans.
10. Cocoanut Nursery.
11. Mango Tree and Fruit.
12. Bunch Palm Nuts and Rubber Tree.
13. Manicoba Rubber Plantation.
14. Alligator Pears or Vegetable Butter.
15. Yucca Tuber similar to Irish Potato.
16. Papayo Tree and Fruit. (Cantaloupe).
17. Sour Sop Tree and Fruit. (Course Strawberry).
18. Caju Fruit. (Lemons).
19. Grape Fruit.
20. Calabash Tree and Fruit.

LESSON 1624-a.

BRAZIL.

1. Rio de Janeiro. Entrance to Bay and Botafogo from Corcovado.
2. Rio de Janeiro. Sugar Loaf Peak and Bay.
3. Rio de Janeiro. New Docks.
4. Rio de Janeiro. Botanical Garden. Corcovado Peak.
5. Rio de Janeiro. Carioca Reservoir—1744.
6. Rio de Janeiro. Aqueduct now used as Bridge—1744.
7. Rio de Janeiro. Junction of Beirado Mar and Rio Branco Ave.
8. Rio de Janeiro. Pysandu St. Royal Palms.
9. Rio de Janeiro. Delivering Furniture.
10. Bahia. Elevator from Landing Place.
11. Bahia. Rio Vermelho "Jangada" or Catamaran.
12. Bahia. Governor's Residence being Repaired—Screens.
13. Pernambuco. River Front.
14. Pernambuco. Governor's Residence.
15. Pernambuco. Daily Newspaper Plant.
16. Para. New Docks.
17. Amazon Valley. Tapping Rubber Tree.
18. Amazon Valley. Smoking or Coagulating Rubber.
19. Upper Amazon. Shipping Rubber.
20. Upper Amazon. Indians.

LESSON **1624-b.**

BUENOS AIRES.

1. Steamer Passing through Basin.
2. Entrance to Basins.
3. Channel Buoys.
4. Callao St. from Sante Fe St.
5. Guitenberg Residence—Belgrano.
6. Colon Theatre — Largest Seating Capacity on Western Hemisphere.
7. Avenue May 25th from Park.
8. President's Palace from July Park.
9. Palace Hotel—July Park—Lola Mora Fountain.
10. President's Palace — Plaza Victoria.
11. February 3rd Park.
12. Refresquerio in July Park with Cantoron.
13. Centennial Bldgs. in Feb. 3rd Park.
14. Industrial School Building.
15. Public School Building.
16. Southern Ry. Station—Constitution Park.
17. Grain Elevators.
18. Entrance to City Slaughter Houses.
19. Cart at Custom House.
20. Argentine Gaucho or Cow Boy.

LESSON **1624-c.**

MONTEVIDEO.

1. Fort Artigas overlooking City.
2. Pier Promenade at Pocitos Hotel.
3. Park Hotel at Urbano Park.
4. Bathing Front — Urbano Park.
5. Bay Front and University.
6. Custom Warehouses and Docks.
7. Avenue July 18th.
8. Residence Street.
9. Private Residence and Grounds.
10. Prado Park.

THE FOLLOWING SETS OF LANTERN SLIDES WERE COLLECTED BY ASST. SUPT. C. G. RATHMANN ON HIS RECENT TRIP THROUGH EUROPE.

LESSON **1628-a.**

LONDON AND WINDSOR.

1. Royal Exchange and Bank of England.
2. House of Parliament.
3. Buckingham Palace, Queen Victoria Monument.
4. Westminster Abbey.
5. Interior, Westminster Abbey.
6. Trafalgar Square.
7. Piccadilly Circus.
8. The Strand and Wellington St.
9. The Strand, Somerset House and St. Mary's Church.
10. Hyde Park.
11. Sunday Morning, Petticoat Lane.
12. Cheapside.
13. Oldest Houses, Staple Inn.
14. Interior, St. Paul's Cathedral.
15. London Bridge and Monument.
16. Windsor Castle from Brocas.
17. East Terrace, Windsor Castle.
18. Throne Room, Windsor Castle.
19. Guard Room, Windsor Castle.

LESSON **1628-b.**

TOWER OF LONDON.

1. Tower of London.
2. St. John's Chapel.
3. Horse Armour Hall.
4. Sub Crypt of the White Tower.
5. Warder.
6. Traitor's Gate.
7. Execution Block and Axe.
8. Lady Jane Grey.
9. Painting "Pool of London." Thames River below the Tower.
10. Crown Jewels.

LESSON **1628-c.**

STRATFORD ON AVON.

1. Stratford on Avon.
2. Shakespeare's Home.
3. Shakespeare's Birthroom.
4. Trinity Church.
5. Bust of Shakespeare, Trinity Church.
6. Shakespeare's Grave and Bust in Trinity Church.
7. Grammar School and Almshouses
8. Shakespeare Memorial Theatre.
9. Shottery, Anne Hathaway's Cottage.

LESSON **1632-a.**

PARIS.

1. Arch of Triumph.
2. Napoleon's Grave, Church of Invalides.
3. Eiffel Tower.
4. Monument, Pantheon.
5. Venus of Milo, Louvre.
6. Upper Part, Main Gate, Notre Dame.
7. Window of Sacred Chapel.
8. Interior of Cathedral.
9. Day Nursery.
10. Officer of the Peace.
11. Mounted Police.
12. Police Barracks.
13. Fire Drill.
14. Dog of the River Brigade.

LESSON **1632-b.**

PARIS.

1. Champs Elysees.
2. Palaces viewed from Alexander Bridge.
3. Louvre.
4. Opera House.
5. Court of Commerce and Jail.
6. Notre Dame.
7. Statue of the Triumph of the Republic.
8. Company of Infantry.
9. "La Monte" and "La Vigie"—Embarkation of the River Brigade.
10. Police Station—Transporting wounded.
11. Central Markets.
12. Hucksters.
13. Electric Fire Engine.
14. Painting, "Joan of Arc" Pantheon.

LESSON **1632-c.**

PARIS.

1. View on the Seine.
2. Place de la Concorde.
3. Louvre, Colonnade and Square.
4. Exchange.
5. Panorama taken from St. Gervais.
6. St. Martin and St. Denis.
7. City Hall.
8. Company of Cavalry.
9. Guardians of the Peace, Carriage Brigade.
10. Police Station "First Aid".
11. Merchants.
12. "Fire Department."
13. Automobile Fire Engine.
14. Rodin's Penseur Statue, Pantheon.

LESSON **1634-a.**

BERLIN.

1. City Hall.
2. Palace Square.
3. National Monument, William the Great.
4. Royal Museum.
5. Royal University.
6. Unter den Linden.
7. Unter den Linden and Frederick St.
8. Cathedral and Castle Bridge.
9. Monument of Victory.

LESSON **1634-b.**

HAMBURG.

1. Steamship, Pres't. Grant, H. A. Line.
2. Jungfernstieg and Pavilion, Hamburg.
3. Street Scene in Old Hamburg.
4. Nicolai Church.
5. Theatre.
6. Rathhaus, City Hall.
7. Canal.
8. Harbor.

LESSON **1634-c.**

DRESDEN, LEIPZIG AND WIESBADEN.

1. Terrace and Steamboat Landing, Dresden.
2. Meissen, Albrechtsburg and Bridge near Dresden.
3. Royal Art Gallery, Dresden.
4. Interior of Zoological Gardens, Dresden.
5. Zoological Gardens, Dresden.
6. Loschwitz Suspension Bridge, Dresden.
7. University, Leipzig.
8. City Art Museum, Leipzig.
9. Publishing House, Leipzig.
10. Voelkerschlacht, Monument, Leipzig.
11. Bach Monument, Leipzig.
12. Fairy Tale Fountain Leipzig.
13. New Town Hall, Leipzig.
14. Kur Haus, Wiesbaden.
15. Concert Hall, New Sanitarium Wiesbaden.
16. Greek Chapel, Wiesbaden.
17. Castle Square, Wiesbaden.

LESSON **1634-d.**

COLOGNE.

1. Cathedral.
2. "Treasury" Cathedral.
3. Main Aisle, Cathedral.
4. Interior, St. Maria.
5. "Treasury" St. Ursula.
6. Assembly Hall.
7. Broad Street.
8. Old Cologne.
9. Court House.
10. Milkwoman.

LESSON **1634-e.**

RHINE SCENES.

1. Drachenfels.
2. Roland Arch.
3. Boppard on the Rhine.
4. Castle Ehrenbreitstein.
5. Stolzenfels.
6. Loreley Rock.
7. Castle Rheinstein.
8. Mouse Tower on the Rhine.
9. Bingen on the Rhine.
10. National Monument, Niederwald.

LESSON **1636-a.**

FRANKFORT AND HEIDELBERG.

1. Roemer, Old Convention Hall.
2. Hall in Roemer.
3. Goethe House.
4. Palm Garden.
5. Cathedral.
6. Railway Station.
7. Kaiserstreet.
8. Hessian Peasants Dancing.
9. Heidelberg Castle.
10. Court of Heidelberg Castle.
11. Heidelberg University.

LESSON **1636-b.**

MUNICH AND VICINITY.

1. New Town Hall.
2. Maximilian Street and Museum.
3. National Museum .
4. Arts and Crafts Institute.
5. Fountain.
6. Glyptothek.
7. Castle Nymphenburg.
8. Partenkirchen, Bavarian Alps.
9. Partnachklamm, Bavarian Alps.
10. Bader Lake and Zugspitze, Highest Mountain in Germany.

LESSON **1637-a.**

VIENNA.

1. Street in Vienna.
2. Opera House.
3. Stephans Church.
4. University and Liebenberg Memorial.
5. Music, Castle Court.
6. Court House.
7. Karlsplatz.
8. Kahlenberg and Leopoldsberg Danube.
9. Museums.
10. Pavilion, Schroenbrunn.
11. "The Adoration of the Shepherds by Rubens in the Lichtenstein Gallery.
12. "Mary's Ascension" by Rubens in the Lichtenstein Gallery.

LESSON **1639-a.**

SWITZERLAND.

1. Rigi and the Alps.
2. Sunset on Rigi.
3. Fluelen and Bristenstock.
4. Kapell Bridge, Lucerne.
5. The Lion of Lucerne.
6. Lucerne and Pilatus.
7. Lucerne and the Alps.
8. Zurich and the Alps.
9. Bridge, Zurich.
10. Zurich showing three Museums.
11. Street in Zurich.
12. Music Hall, Zurich.

LESSON **1645-a.**

HOLLAND.

1. Rotterdam.
2. Street in Rotterdam.
3. Marken on the Marshes.
4. Scene in Holland.
5. Dutch Peasant's Trap.
6. Country Woman.
7. Sleighing Party.
8. Harrowing in Holland.
9. Inhabitants of Volendam.
10. Inhabitants of Volendam.

LESSON **1645-b.**

BELGIUM.

1. Palace of Justice, Brussels.
2. City Hall, Brussels.
3. City Hall Square, Brussels.
4. Cathedral, Brussels.
5. Pulpit in Cathedral, Brussels.
6. Park, Brussels.
7. Milkcart, Brussels.
8. Milkmaids, Brussels.

LESSON **1646-a.**

SWEDEN.

1. National Museum, Stockholm.
2. Royal Castle, Stockholm.
3. Conference Room, Royal Castle.
4. Hall, Royal Castle.
5. Street in Stockholm.
6. Opera House, Stockholm.
7. Park, Stockholm.
8. Skeppsbron (Landing Place) Stockholm.
9. Vasa Street, Stockholm.
10. Vasaparken, Stockholm.
11. Swedish Peasant.
12. Swedish Women.
13. Swedish Peasants, Telemarken.

LESSON **1646-b.**

DENMARK.

1. Exchange, Copenhagen.
2. Round Tower, Copenhagen.
3. Tivoli, Concert Hall, Copenhagen.
4. Thorwaldsen Museum, Copenhagen.
5. "Christ" Thorwaldsen Museum.
6. "St. John" Thorwaldsen Museum.
7. "Morning" Thorwaldsen Museum.
8. "Night" Thorwaldsen Museum.
9. Fountain, Copenhagen.
10. Dyrgarden, Park, Copenhagen.
11. Cathedral, Roeskilde Denmark.

LESSON **1737-a.**

CHARACTERS FROM DICKENS' WRITINGS.

1. Mr. Peggotty & Little Em'ly, David Copperfield.
2. Mr. Micawber makes Punch, David Copperfield.
3. Quilp, Old Curiosity Shop.
4. Old Curiosity Shop, London.
5. Oliver Twist Asks for More.
6. The Artful Dodger, Oliver Twist.
7. Bumble, Oliver Twist.
8. Bob Cratchit's Christmas Dinner, Christmas Carol.
9. Mr. Stiggins, Pickwick Papers.
10. Sam Weller, Pickwick Papers.
11. Pickwick, Pickwick Papers.
12. Sarah Gamp, Martin Chuzzlewitt.
13. Trotty Veck, and His Daughter Meg, The Chimes.

GROUPS OF SLIDES, SHOWING VARIOUS PHASES OF SCHOOL LIFE IN SOME OF THE EUROPEAN COUNTRIES.

GROUP **1743.**

1. Girls' School, Hamburg.
2. District School House, Munich.
3. District School House, Munich.
4. Goethe High School, Frankfort.
5. Muster Schule, Frankfort.
6. Continuation School, Frankfort.
7. Moll District School, Mannheim.
8. School on Allerheiligenplatz, Vienna.
9. Boys' High School, Zurich.
10. District School, Zurich.
11. District School, Zurich.
12. High School, Stockholm.
13. Maria District School, Stockholm.
14. Sundholm School, Copenhagen.
15. Corridor and Stairs, Frankfort.
16. Vestibule of School, Malmoe, Sweden.
17. Auditorium, in High School, Stockholm.
18. Schoolroom. High School, Stockholm.
19. Schoolroom, District School, Vienna.
20. Schoolroom, Zurich.
21. Schoolroom, Zurich.
22. Claymodeling 1st Grade, Brussels.
23. Schoolroom, Copenhagen.
24. Teachers Conference Room, Zurich.

GROUP **1744.**

1. Nature Study Room, District School, Copenhagen.
2. Art Room, Sundholm Volkschule, Copenhagen.
3. District School, Munich.
4. Nature Study, Dist. School, Munich.
5. Arithmetic, Dist. School, Munich.
6. Sewing, District School, Munich.
7 Cooking Room, Dist. School, Berlin.
8. Gymnasium for Boys, Zurich.
9. Gymnasium for Girls, London.
10. Showerbaths, Dist. School, Brussels.
11. Bathing, Stockholm.
12. Roof Playground, Elementary School, Vienna.
13. Roof Playground Elementary School, Mannheim.
14. Secondary School for Boys, Hackney Downs, London.
15. Ele. School Laboratory, Hackney Downs, London .
16. Battalion Band, Hackney Downs, London.
17. Athletic Sports, Hackney Downs, London.
18. Swimming Bath, Hackney Downs, London.
19. Clapham Sec. School for Girls, London.
20. Drawing, Clapham School for Girls, London.
21. Putney Sec. School, London.
22. Putney Art School, London.
23. Hugh Middleton Dist. School, London.
24. Secondary School, Paris.
25. Arts and Crafts School, Paris.
26. Schoolroom, Paris.
27. Demonstration Room, Chemistry, High School, Paris.

GROUP **1745.**

1. School Luncheon, Zurich.
2. Soup Kitchen, Zurich.
3. Luncheon, Dist. School, Stockholm.
4. Luncheon, Dist. School. Copenhagen.
5. Vacation Excursion, Berlin.
6. Vacation Excursion, Frankfort.
7. School Excursion, Mannheim.
8. School Excursion, Zurich.
9. Vacation Excursion, Paris.
10. Vacation Colony, Girls, Berlin.
11. Vacation Colony for Weak Children. Zurich.
12. House for Tuberculous Children. Zurich.
13. Open Air School, Winter, Zurich.
14. Vacation Games, Berlin.
15. Vacation Games, Berlin.
16. Vacation Play, Stockholm.
17. Vacation Play, Berlin.
18. Court in House, Frankfort.
19. Bldg. of Jugendfuersorge Committee, Hamburg.
20. Teachers College, Leipzig.
21. Auditorium, Teachers College, Leipzig.
22. Faculty, Normal School, Leipzig.
23. Senior Students, Teachers College, Leipzig.
24. Teachers Training School, Stockholm.
25. Teachers 99th. District School, Berlin.

GROUP **1746.**

1. Geology, Copenhagen.
2. Excursion, Frankfort.
3. Excursion, Drawing, Frankfort.
4. Skansen Nature Park in Summer, Stockholm.
5. Skansen Park in Winter, Stockholm.
6. Biological Museum, Stockholm.
7. Avenue of Victory, Berlin.
8. Fairy Tale Fountain, Cologne.
9. Castle Garden, Vienna.
10. Monument of Victory, Leipzig.
11. Bavaria Monument, Munich.
12. Man. Training, Metal Work, Stockholm.
13. Man. Training, Woodwork, Stockholm.
14. Cooking, District School, Stockholm.
15. Cooking, District School, Stockholm.
16. Sewing Dist. School, Copenhagen.
17. Household Teaching, Stockholm.
18. Open Air Gymnastics, Dist. School, Berlin.
19. Out-Door Gymnastics, Putney School, London.
20. Open Air Gymnastics, Stockholm.
21. Field-Day Dist. School Berlin.
22. Out-Door Gymnastics, Berlin.
23. Calisthenics at Recess, Berlin.
24. Calisthenics at Recess, Dist. School, Berlin.
25. Pupils Receiving Swimming Instructions, Berlin.
26. Girls' Swimming School, Copenhagen.
27. Military Drill, High School, Stockholm.

GROUP **1747.**

1. Kindergarten, Vienna.
2. Kindergarten, Paris.
3. Feeding Children, Kindergarten, Paris.
4. Hall of Kindergarten, Brussels.
5. Open Air School, II, London.
6. Open Air School, III, London.
7. Open Air School, VII, London.
8. Open Air School, V, London.
9. Open Air School, IV, London.
10. Open Air School, I, London
11. Open Air School, Charlottenburg.
12. Open Air School, Charlottenburg.
13. Open Air School, Charlottenburg.
14. Open Air School, London.
15. Open Air School, VII, London.
16. Open Air School, London.
17. Open Air School, London.

GROUP **1748.**

1. Mannheim, School Organization.
2. Schedule of Mannheim School Organization.
3. Schoolroom, Mannheim.
4. School for Defectives, Mannheim.
5. School for Defectives, Leipzig.
6. School for Defectives, Leipzig.
7. School for Defectives, Stockholm.
8. Workshop for Poor Children, Stockholm.
9. Deaf Mute School, London.
10. Treating Children's Teeth, Berlin.
11. People's High School, Roeskilde, Denmark.
12. People's High School, Roeskilde, Denmark.
13. People's High School, Roeskilde, Denmark.
14. People's High School, Roeskilde, Denmark.
15. Assembly Talk, People's High School Roeskilde, Denmark.
16. Auditorium People's High School Roeskilde, Denmark.

GROUP **1749.**

1. Continuation School Bldg. Munich.
2. Auditorium. Trade School, Frankfort.
3. Technological Exhibit, Frankfort.
4. Continuation School, Watchmakers, Munich.
5. Commercial Continuation School, Munich.
6. Continuation School, Shoeworkers, Munich.
7. Continuation School, Tailors, Munich.
8. Trade School, Blacksmiths, Munich.
9. Trade School, Machinists, Munich.
10. Trade School, Coppersmiths, Munich.
11. Drawing, Coppersmiths, Munich.
12. Trade School, Carpenters, Munich.
13. Continuation School, Coachmen, Munich.
14. Trade School, Tinsmiths, Munich.
15. Continuation School, Barbers, Munich.
16. Continuation School, Waiters, Munich.
17. Continuation School, Chimneysweeps, Munich.
18. Continuation School, Printers, Munich.
19. Continuation School, Builders Munich.
20. Continuation School, Drawing for Builders, Munich.
21. Trade School for Masons, Munich.
22. Cabinet Makers, Leipzig.
23. School for Machinery, Leipzig.
24. Engineering Workshop, Frankfort.
25. Machine Room, Tr. School, Leipzig.
26. Tr. School for Smiths, Berlin.
27. Machinery Room for Woodcarving, Leipzig.
28. School for Machinists, Cologne.
29. Electrical Laboratory, Machinists, Leipzig.
30. Laboratory of Mechanics, Munich.
31. Laboratory for Physics, Berlin.
32. School for Machinery, Cologne.
33. Machines for Metalwork, Leipzig.
34. Machinists, Berlin.
35. Modeling Room, Woodcarving, Leipzig.
36. Exhibit of Woodcarving Carving School, Leipzig.
37. Reading Room, Carving School, Pupil's Work, Leipzig.
38. Drawing, Arts and Crafts School, Munich.
39. Arts and Crafts School Building, Hamburg.
40. Drawing, Arts and Crafts School, Berlin.
41. Drawing, Arts and Crafts School, Berlin.
42. Mastercourses, Cologne.
43. Mastercourses, Tailors, Cologne.
44. Technical High School, Charlottenburg.
45. Royal Academy, Leipzig.

GROUP **1750.**

1. Continuation Trade School, Vienna.
2. Continuation School Physics, Vienna.
3. Arts and Crafts School, Brussels.
4. Ecole. Prin. Sup., Brussels.
5. Ecole. Prin. Sup., Brussels.
6. Tailoring Brussels.
7. Carpenters, Brussels.
8. Iron Workers, Brussels.
9. Manual Tr. Ecole Boulle, Paris.
10. Cooking, Paris.
11. Making Artificial Flowers, Trade School, Paris.
12. Arts and Crafts School, London.
13. Drawing, Arts and Crafts School, London.
14. City and Guilds Central Tech. College, London .
15. Shoreditch Tech. Institute, Girls making Clothing, London.
16. Shoreditch, Tech. Institute, Girls Upholstering, London.
17. Shoreditch Tech. Institute, Carpenters, London.
18. Physical Laboratory, Tech. Institute, Copenhagen.
19. Physics Elementary School, Copenhagen.

PHONOGRAPH DISC RECORDS.

INSTRUMENTAL MUSIC RECORDS.

COLLECTIONS—

1800.	Battleship Connecticut March and Under the Double Eagle (J. F. Wagner)	35205	12
1801.	Blue Danube Waltz (Johann Strauss) Vienna Quartet	31777	12
1802.	By the Brook—Idyl (Wetzger) Flute. John Lemmone	70023	12
1803.	Csardas—Hungarian Folk Dance and Oxdansen—Swedish Folk Dance	17003	10
1804.	Dance of the Hours—Victor Orch and Sweet Longings—Violin-Flute	35087	12
1805.	Dance of the Song Birds (Richmond) Victor Orchestra	4648	10
1806.	Hear Me, Norma (Bellini) Oboe and Clarinet (Doucet-Christie) (2) Tarentelle (Saint-Saens) Flute-Clarinet Barone-Christie and Siegfried's Call (Wagner) French Horn (A. Horner) (2) Sweet Bird (From "Il Pensieroso") (Handel) Oboe and Flute—Doucet-Barone	17174	10
1807.	Highland Fling—Scotch Folk Dance and Kamarinskaia—Russian Dance	17001	10
1808.	High School Cadets March (Sousa) and Semper Fidelis March (Sousa)	35208	12
1809.	Humoresque (Dvorak) Violin. Mischa Elman	74163	12
1810.	Humoresque (Dvorak) Violin. Fritz Kreisler	74180	12
1811.	In a Clock Store—Descriptive Fantasia (Orth) Victor Orch Apprentice opens the store—ticking clocks—they strike, cuckoo, grandfather's clock. The boy blithely whistles—Several clocks run down and are wound. A musical clock plays a popular air. Four o'clock strikes on many clocks, from the miniature Dresden to the huge Scotch cathedral.	31618	12
1812.	Instruments of the Orchestra—Part I, Strings. Victor Orchestra. 1. The Violin—Spring Song (Mendelssohn)—2. The Viola—Traumerei (Schumann)—3. The Violoncello—Flower Song (Lange)—4. Contra Bass—Improvisation—5. Violin Pizzicato—Dream After the Ball (Brostet)—6. String Quartet—Intermezzo (Mascagni—7. The Harp—Harp That Once Through Tara's Halls and Instruments of the Orchestra—Part II, Woodwind—Victor Orchestra.—1. The Piccolo—Yankee Doodle—2. The Flute—William Tell Overture—3. The Oboe—William Tell Overture—4. The English Horn—Tannhauser—5. The Clarinet—Zampa (Herold)—6. The Bassoon—Deep in the Cellar—7. The Woodwind Section—Lohengrin	35236	12
1813.	Instruments of the Orchestra—Part III, Brass. Victor Orchestra. 1. The French Horn—Titl's Serenade—2. The Cornet—Red, White and Blue—3. The Trombone—Rocked in the Cradle of the Deep—4. The Tuba—Rocked in the Cradle of Deep—5. Brass Quartet—Day of the Lord and Instruments of the Orchestra—Part IV, Percussion Instruments and Entire Orchestra. Victor Orchestra. 1. The Timpani (Kettledrums)—2. The Small Drum 3. Bells—Monastery Bells (Wely)—4. The Entire Orchestra—Finale. William Tell Overture. NOTE—These orchestra illustration records are divided into sections for teaching purposes, and cannot be played continuously.	35237	12

1807.	Kamarinskaia—Russian Folk Dance and Highland Fling—Scotch Folk Dance	17001	10
1814.	Molodka—Folksong (2) Sun in the Sky (Folk Dance) Balalaika Orch	70034	12
1803.	Oxdansen—Swedish Folk Dance and Csardas—Hungarian Folk Dance	17003	10
1815.	Reap the Flax—Swedish Folk Dance and St. Patrick's Day—Irish Jig	17002	10
1815.	St. Patrick's Day—Irish Jig and Reap the Flax—Swedish Folk-Dance	17002	10
1808.	Semper Fidelis March (Sousa) and High School Cadets March (Sousa)	35208	12
1806.	Siegfried's Call (Wagner) French Horn (2) Sweet Bird (From "Il Pensieroso") (Handel) Oboe and Flute and (1) Hear Me, Norma (Bellini) Oboe and Clarinet (2) Tarantelle (Saint-Saens) Flute and Clarinet	17174	10
1816.	Spinning Wheel (Unaccompanied) Spindler	60026	10
1804.	Sweet Longings (Menzel) Violin-Flute. Rattay and Lyons and Dance of the Hours—Gioconda (Ponchielli) Victor Orchestra.	35087	12
1817.	Symphony in B Minor (Unfinished) 1st Movement. Pryor's Band	31798	12
1800.	Under the Double Eagle and Battleship Connecticut March (J. F. Wagner)	35205	12
1818.	William Tell—Overture—Part III—The Calm—Pryor's Band and Part IV—Finale—Pryor's Band	35121	12

VOCAL MUSIC RECORDS.

COLLECTIONS—

1900.	Birds of the Forest Gavotte (Adolfo) Whistling Gialdini and Spring Voices (Fruhlingsstimmen) (Strauss) Whistling. Gialdini.	16835	10
1901.	Bridge, The (Carew) Hayden Quartet and Old Oaken Bucket (Woodworth) Peerless Quartet	16217	10
1902.	Clang of the Forge (Rodney) Emilio de Gogorza	64037	10
1903.	Dew Drop. A (Sherman-Gilchrist) (2) Rain Song (Smith) (From Modern Primer, Silver, Burdett & Co.) and (1) Mother Goose No. 1 (2) Hey diddle diddle (3) Little Bo-Peep (4) Twinkle, Twinkle (5) Little Jack Horner (6) Ride a Cock Horse (Elliott) Elizabeth Wheeler.	17004	10
1904.	Estudiantina Waltz (P. Lacome) Lyric Quartet	5869	10
1905.	Good-Bye, Sweet Day (Vannah) In English. Janet Spencer	64189	10
1906.	Gypsy Life (Schumann) Lyric Quartet and Oh, Italia, Italia, Beloved (Donizetti) Victor Chorus	35254	12
1907.	Hark, Hark! the Lark (Schubert) Piano acc.) Evan Williams	64218	10
1908.	How Lovely are the Messengers (Mendelssohn) Lyric Quartet and Merry Life. A ("Funiculi, Funicula") (Denza) Lyric Quartet	17208	10
1909.	In China (2) In Scotland (3) In Germany (From "Art Song Cycles") (Fox-Miessner) Elsie Baker. and (1) The Scarecrow (2) The Acorn (Seeds that Fall) (3) The Burr (Seeds that Stick) ("Art Song Cycles" —Silver, Burdett & Co.) (Fox-Miessner) Baker.	17199	10
1910.	Just Before the Battle, Mother (Root) John Young and Tramp, Tramp, Tramp (The Prisoner's Hope) (Root) John Young.	16987	10

1911.	Largo (From "Xerxes") (Handel) In French. Charles Gilibert	74155	12
1908.	Merry Life, A ("Funiculi, Funicula") (Denza) Lyric Quartet and How Lovely are the Messengers (Mendelssohn) Lyric Quartet	17208	10
1912.	Messiah—Why Do the Nations (Handel) Herbert Witherspoon	74072	12
1913.	Moon Drops Low, The (From "American Indian Songs") (Cadman). Janet Spencer	64200	10
1903.	Mother Goose No. 1 (Elliott) "Hey Diddle Diddle" "Little Bo-Peep"—"Twinkle, Twinkle"—"Little Jack Horner"—"Ride a Cock Horse" and (1) Dew Drop (Gilchrist) (2) Rain Song (Smith). Wheeler.	17004	10
1914.	My Old Kentucky Home (Foster) and Old Folks at Home (Foster) Baker	16389	10
1915.	National Airs of All Nations. Victor Chorus	31855	12
1916.	Oh, For the Wings of a Dove. Lucy Isabelle Marsh	70083	12
1906.	Oh, Italia, Italia, Beloved (Donizetti) Victor Chorus and Gypsy Life (Schumann) Lyric Quartet	35254	12
1914.	Old Folks at Home—Baker and My Old Kentucky Home (Foster) Macdonough	16389	10
1901.	Old Oaken Bucket (Woodworth) and The Bridge (Carew) Hayden Quartet	16217	10
1917.	Santa Lucia (Neapolitan) Miller and Watch on the Rhine —Werrenrath	16882	10
1909.	The Scarecrow (2) The Acorn (Seeds that Fall (3) The Burr (Seeds That Stick) (From "Art Song Cycles," published by Silver, Burdett & Co.) (Fox-Miessner) Elsie Baker and (1) In China (2) in Scotland (3) In Germany Elsie Baker.	17199	10
1918.	Songs My Mother Taught Me (Als die alte Mutter) In English (Dvorak). Lucy Marsh	60078	10
1919.	Spinning Wheel Quartet In English. Victor Opera Quartet	70052	12
1900.	Spring Voices (Fruhlingsstimmen) (Whistling) Gialdini and Birds of the Forest Gavotte (Waldvoglein) (Adolfo) Gialdini.	16835	10
1920.	Stabat Mater—Inflammatus (To Thy Holy Care) Lucy Isabelle Marsh with Victor Chorus	70037	12
1910.	Tramp, Tramp, Tramp (Root). John Young and Just Before the Battle, Mother (Root. John Young	16987	10
1917.	Watch on the Rhine (Die Wacht am Rhein) In English Werrenrath and Santa Lucia—Neapolitan Folk Song— Reed Miller	16882	10
1921.	Whispering Hope (Hawthorne) Alma Gluck and Louise Homer	87107	10

LITERATURE RECORDS.

COLLECTIONS—

2000.	Abou Ben Adhem (Leigh Hunt) (2) Annabel Lee (Poe) Frank Burbeck and (1) The Last Leaf (Holmes) (2) L'Envoi (Kipling) Frank Burbeck	16989	10
2000.	Last Leaf. The (Holmes) (2) L'Envoi (Kipling) Burbeck and Abou Ben Adhem (Leigh-Hunt) (2) Annabel Lee (Poe). Burbeck.	16989	10
2001.	Out to Old Aunt Mary's. James Whitcomb Riley	70078	12

LIBRARY OF CONGRESS
0 009 564 228 7